

# JVC

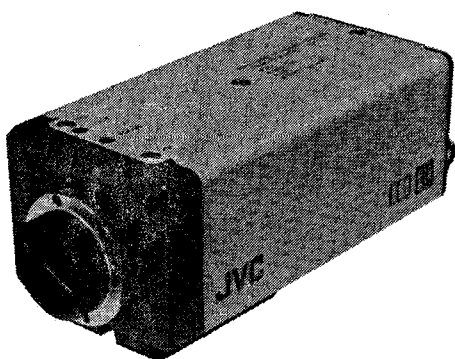
## SERVICE MANUAL

### COLOUR VIDEO CAMERA

## MODEL TK-885E

BASIC CHASSIS

V 54



## CONTENTS

- INTRODUCTION AND REPAIR SERVICE
- ADJUSTMENT
- PARTS LIST
- STANDARD CIRCUIT DIAGRAM

(NOTE) Electrical components having special safety-related characteristics are identified by shading (■) on the schematic and by (▲) on the parts list in Service Manual. When replacing these components, be sure to use designated parts.

## SPECIFICATIONS

Item	Content	Item	Content
Type	Colour video camera head	Selective functions	AGC (automatic gain control) selection "ON/OFF", Shutter mode selection "NORM/1/1000", White balance selection * (natural light), ▲ (TTL auto-pur-suit), * (illumination light)
Signal system	Conforms to PAL system	Lens mount	CS mount (C mount when adapter is used)
Image pickup device	1/2-inch solid-state CCD, single-board type.	Power supply	DC 12 V ( $\pm 10\%$ ), ripple voltage of less than 50 mV
Number of effective picture elements	500 (horizontal) $\times$ 582 (vertical)	Power consumption	3.5VA (DC 12V)
Number of scanning lines	625 lines, 2:1 interlaced	Operating temperature range	$-10^{\circ}\text{C} \sim +50^{\circ}\text{C}$
Sync system	Internal sync	Operating humidity range	Less than 90% Rh (without condensation)
Video output	Composite video signal/1.0 Vp-p, 75 $\Omega$ unbalanced, terminal BNC connector	Provided accessories	Lens mount cap $\times$ 1 C-mount adaptor $\times$ 1 Iris plug (3 pin) $\times$ 1
Video S/N ratio	47dB	Fuse	QMF51E2-1R0S (1A)
Resolution	320 TV lines (horizontal)	Dimensions	Width 64 mm (max.), depth 150 mm. (max.), height 62 mm (max.) (including C-mount adaptor and cable clip)
Minimum object illumination	10Lux (F1.4, AGC "ON")	Weight	Approx. 500 g. (including C-mount adaptor)
Standard object illumination	2000Lux		

\* Design and specifications are subject to change without notice.

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# 1. INTRODUCTION AND REPAIR SERVICE

## OPERATING INSTRUCTIONS

Thank you for purchasing a JVC colour video camera head. The TK-885E is high-quality camera that uses a single CCD (Charge Coupled Device) pickup element. To obtain the best results from your new camera, read this instruction manual carefully before use.

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**WARNING:**  
TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

**CAUTION:**  
To prevent electric shock, do not open the unit. No user serviceable parts inside. Refer servicing to qualified service personnel.

**CAUTION:**  
To prevent electric shocks and risk of fire hazards, do NOT use other than specified power source.

This installation should be made by a qualified service person and should conform to all local codes.

\* This instruction book is divided into three sections, English, German and French:

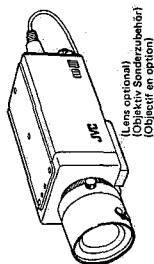
- English ..... page 2 - 20
- German ..... pages 21 - 39
- French ..... pages 40 - 58

**When improper operation or a malfunction is observed:**  
While operating, if any abnormal condition (strange sound, smell or smoke) or malfunction (no picture, etc.) is observed, stop using the camera immediately, turn the power off, then call your local dealer.

**Cleaning**  
Turn the power off and wipe the dirt away with a dry soft cloth. If it is extremely dirty, use furniture cleaner to wipe it off.  
To clean lenses, use a blower or lens cleaning tissue (available from any camera dealer).

- Use**
- Do not point the camera towards the sun. This could damage the camera regardless of whether it is operating or not.
  - Do not shoot sources of bright light. If the object contains very bright areas, vertical or horizontal bright lines may appear on the screen. This is called "smear", a phenomenon which often occurs with solid-state pickups, and is not a malfunction.
  - Do not disassemble the camera. Never touch the inside of the camera. This could damage the camera.
  - Do not allow anything to get inside the camera. If a metal or flammable object gets inside the camera, it may cause a malfunction.
  - Handle with care. Do not drop the camera or subject it to shocks and vibrations to avoid possible damage.

## JVC Instruction Book Bedienungsanleitung Manuel d'instructions TK-885E COLOUR VIDEO CAMERA HEAD FARB-VIDEOKAMERA-KOPF TÊTE DE CAMERA VIDEO COULEUR



### Easy installation

The camera has installation holes on both its top and bottom panels. While its extremely compact size and light weight make possible installation almost anywhere. External fine adjustment of the neck is possible. Power supplies of DC 12 V can be used. With the optional AC adaptor AC-C024 (for the U.K.) or AC-C022 (for countries other than the U.K.), AC 220 - 240 V can also be used.

### PRECAUTIONS

#### Installation

- Never expose the camera to rain or water. Water can cause malfunctions and damage the camera.
- Do not install the camera where the temperature could exceed the allowable range. If used at extremely low or high temperatures, the camera could be damaged (allowable operating temperature range: -10°C to +50°C).
- Avoid installing in humid or dusty places. This could damage the camera.
- Avoid installing in places where there are vibrations. This could damage CCD and other components and cause a malfunction.
- Avoid installing in places where there are strong magnetic fields and electric signals. The monitoring picture may be distorted.
- Avoid installing in places where it will be subject to strong vibrations. This could damage components and degrade the picture.

### FEATURES

#### CCD (Charge Coupled Device) solid-state pickup

CCD pickup elements are extremely durable and resistant to shocks and vibrations. There is virtually no image lag, burn or geometrical distortion.

#### High resolution, high sensitivity

The CCD complementary colour system makes possible a high resolution of 320 TV lines, with a superior low-light sensitivity of 10 lux.

#### TTL (through-the-lens) auto white balance adjustment

The white balance is optimized by auto tracking of the colour temperature of the ambient light. The sensor detects the colour temperature of the light entering through the camera lens.

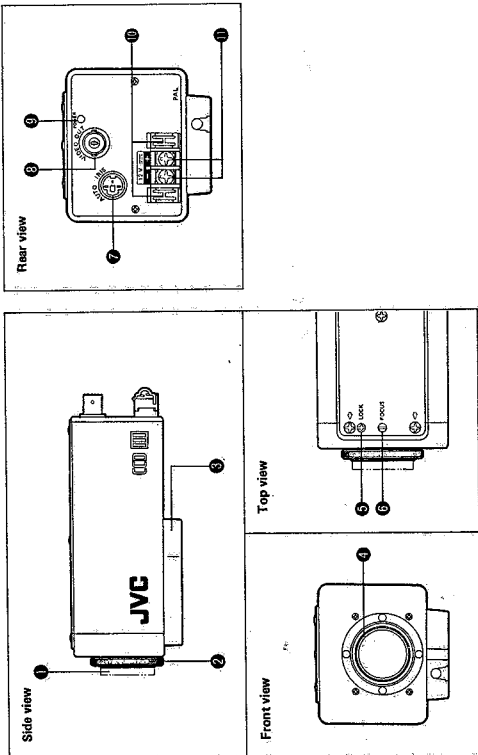
#### 1/1000-Second high-speed electronic shutter

The high-speed shutter mode allows fast-moving objects to be recorded with excellent detail. In still or slow-motion playback, profiles of these objects are clear with no blurring.

#### Exchangeable lens mount (C/CS)

C (for 1/2" or 1" video camera lenses) and CS (1/2" video camera lenses) lens mounts can be installed so that selection from a wide range of lenses is possible.

## CONTROLS AND CONNECTORS



### ⑨ Cable clip

Use to hold the iris cable of an auto-iris lens. (See pages 9 and 10.)

### ⑩ 12 V — power input terminals

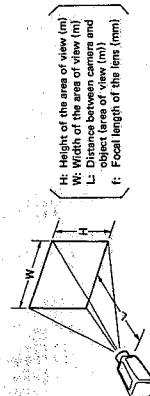
Connect to a DC 12 V power source. An AC 220 — 240 V source can be used with the optional AC adaptor AC-C824 (for the U.K.) or AC-C822 (for countries other than the U.K.). (See pages 12 and 13.)

## USING LENSES

- The TK-885E can use 1/2", 2/3" or 1" video camera C-mount lenses. When the C-mount adaptor (standard accessory) is installed, when removed, 1/2" video camera C-mount lenses can also be used.

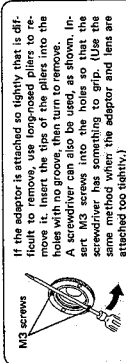
- Use a suitable lens for the required area of view. The area of view for different focal lengths can be obtained using the following formulae. (Use as reference data, when the distance between camera and object (L) is more than 100 times the focal length (f).)

$$\text{Formulae for obtaining the area of view} \quad H = \frac{4.6 \times L}{f} \quad W = \frac{6.2 \times L}{f}$$



- Lens mount cap**  
Be sure to cap the lens mount when the lens is not mounted. (The lens mount cap is in place when shipping.)  
To attach: Turn clockwise.  
To remove: Turn counterclockwise.

- C-mount adaptor**  
Attach to change the lens mount from "CS" to "C".  
(The C-mount adaptor is attached when shipping.)  
To attach: Turn clockwise.  
To remove: Turn counterclockwise.



- Tripod mounting base**  
2 screw holes (1/4"-20UNC) are provided for mounting the camera on a fixed or rotating base or tripod. This base can also be installed on the top panel for greater flexibility in installation.  
The iris cable of the lens can be stored and fixed in this base. (See pages 9, 10 and 19.)

- Lens mount**  
The camera has a CS mount; C-mount lenses can be used when C-mount adaptor ⑨ is attached.  
(The C-mount adaptor is attached when shipping.)  
C mount: For 1/2", 2/3" or 1" video camera C-mount lenses.  
CS mount: For 1/2" video camera CS-mount lenses.

- LOCK screw**  
Loosen this screw when adjusting the flange-back (distance between the focal point and the lens mount). Upon completion of adjustment, retighten it.

- FOCUS screw**  
Turn to adjust the flange-back when focusing is not possible with the focus ring of the lens. (See page 14.)

- AUTO IRIS connector**  
Connect the iris cable of an auto-iris lens. If the lens' cable plug is a different type, use the provided 3-pin iris plug. (See page 11.)

- VIDEO OUT connector**  
BNC connector that outputs a composite video signal. Connect to the video input connector of a monitor, switcher, etc.

- POWER indicator**  
Lights when the camera is powered.

**Note:**

- Use auto-iris lenses powered by DC 9 V — 10 V with power consumption of 50 mA or less.
- L in the illustration below should be as shown in the following table. If L exceeds the value in the table, it may damage the inside of the camera and correct mounting may be impossible; never use such lenses. Be careful not to attach the C-mount adaptor when using a CS-mount lens.

Lens	Flange-back	Distance L
C-mount lens*	17.526 mm	Less than 9 mm
CS-mount lens**	12.5 mm	Less than 4 mm

\* With the C-mount adaptor attached.  
\*\* With the C-mount adaptor removed.

Lenses designed for colour video cameras are recommended. Lenses designed for B/W cameras may have inferior colour reproduction and picture quality. In particular, they are not suitable for use outdoors or in very bright conditions. When using a lens with an ND filter attached, camera shooting may not be possible with the specified minimum required illumination.

The optional JVC colour video camera lenses HZ-C7.5U and HZ-C8U can be used.

Model No.	Focal distance	Max. aperture	Iris	Focus
HZ-C7.5U	f = 7.5 mm	f/1.4	Automatic	Fixed
HZ-C8U	f = 8 mm	f/1.2	Automatic	Fixed

\*The HZ-C7.5U is for colour video cameras with a pickup element of 2/3" or less. The HZ-C8U is for those with a pickup element of 1/2" or less.

\*The HZ-C7.5U and HZ-C8U are equipped with the 3-pin iris plug that matches the TK-885E's AUTO IRIS connector.

**Example of calculation of area of view**  
The area of view, when the distance between camera and object (area of view) is 15 m with the optional HZ-C7.5U lens attached, can be calculated as follows.

$$\begin{aligned} \text{Height of area of view (m)} \quad H &= \frac{4.6 \times L}{f} \\ &= \frac{4.6 \times 15}{7.5} \\ &= 9.2 \end{aligned}$$

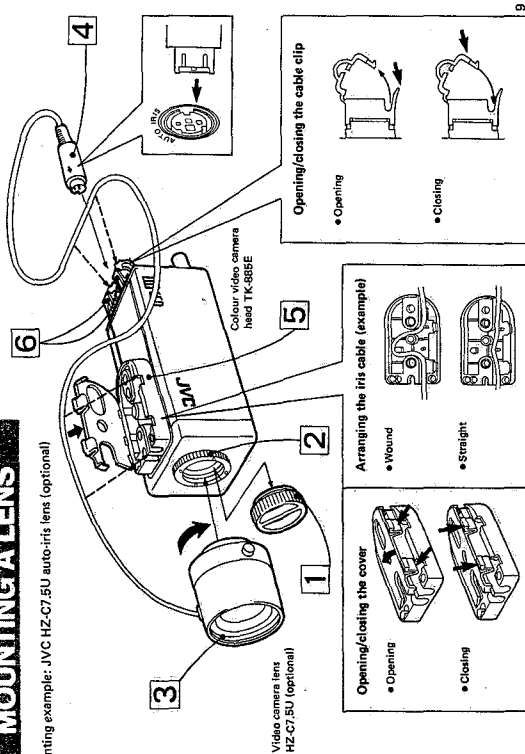
$$\begin{aligned} \text{Width of area of view (m)} \quad W &= \frac{6.2 \times L}{f} \\ &= \frac{6.2 \times 15}{7.5} \\ &= 12.4 \end{aligned}$$

As above, the area of view will be of approx. 9.2 m high and approx. 12.4 m wide.



## MOUNTING A LENS

Mounting example: JVC HZ-C7.5U auto-iris lens (optional)



1 Turn the lens mount cap to remove it.

2 Attach or remove the C-mount adaptor depending on the lens used.

C-mount adaptor	Lens mount	Acceptable lenses
Attached	C mount	1/2", 2/3" or 1" video camera/C-mount lens
Removed	CS mount	1/2" video camera CS-mount lens

\* The C-mount adaptor is attached when shipped.  
\* The optional JVC HZ-C7.5U is a C-mount lens for 2/3" colour video camera.

3 Attach the lens to the lens mount. Secure it so it does not get loose.

\* The JVC HZ-C7.5U video camera lens (optional) is designed so it can be rotated even after it is attached to the camera. If the lens cable is not positioned correctly, forcibly turn the lens to adjust the position.

4 If the lens has an auto-iris, connect the auto-iris plug (3-pin) to the AUTO IRIS connector. (See page 11.)

\* Use an auto-iris lens that processes the video signal as the input signal.

5 If the lens has an auto-iris, attach the auto-iris cable to the camera with the tripod mounting base (when the cable is too long).

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## CONNECTIONS

- Do not turn the power of any equipment connected on until all connections are completed.
- Read the instruction manuals of all equipment to be connected.

### AUTO IRIS connector

- Connect the auto-iris plug of the auto-iris lens.
- If the auto-iris lens has a different type of auto-iris plug, replace with the plug provided.

Note: Use auto-iris lenses using DC 9 V - 10 V with a power consumption of 50 mA or less.

Pin assignment: AUTO IRIS connector (3-pin)

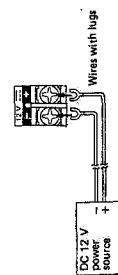
Pin No.	Signal
1	GND
2	Video (high impedance)
3	DC 9 V - 10 V (50 mA max.)

### VIDEO OUT connector

- BNC connector for video signal output.
- Connect to the video input connector of equipment such as a monitor, switcher, etc.
- Use a coaxial cable for connection.

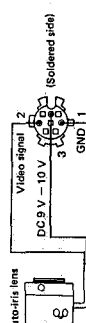
### Power input terminals (12 V =)

- For power supply from a DC 12 V source.
- When connecting, be sure that the polarities (+/-) are correct. The use of wires terminated by lugs is recommended.
- The power voltage is specified as DC 12 V ( $\pm 10\%$ ).
- The optional AC adaptor AC-C524 (for the U.K.) or AC-C522 (for countries other than the U.K.) which is designed exclusively for use with the TK-885E is also possible. (See next page.)



Provided iris plug (3-pin) QMC0308-001

- Connections: Use this plug by soldering it to the lens control cable.



### Assembly



### Clamp



\* Use a cable with diameter of 4.8 mm or less.

### Notes:

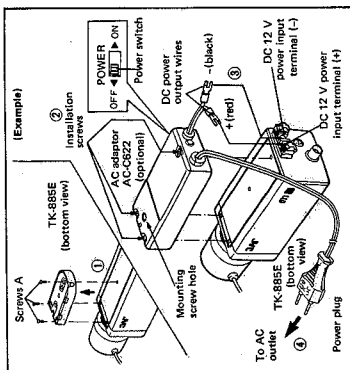
- Be sure not to connect the power source until all other connections are completed. Do not turn the power of any equipment on until connections are completed.
- Use DC 12 V power source with a ripple voltage of less than 50 mV.
- When powered, the POWER indicator on the rear panel will light.

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- AC Adaptor AC-C624 and AC-C622 (optional)**
- An AC adaptor designed exclusively for use with the TK-885E, to receive line AC power, installed on the bottom of the camera.
  - A power voltage of AC 220 ~ 240 V can be used.
  - This AC Adaptor is available in two models: AC-C624 (for the U.K.) and AC-C622 (for countries other than the U.K.). Both are identical in construction and specifications except that the U.K.-bound AC-C624 is shipped without plug at the end of the provided power cord.

#### Installation

- Loosen three screws A to remove the tripod mounting base.
  - Install the AC adaptor to the camera with the 3 screws provided with the AC adaptor. The screws provided with the AC adaptor cannot be removed.
  - Connect the DC power output wire to the camera's DC 12 V terminals, making sure that the polarity is correct.
    - Black: (-) DC power output wire
    - Red: (+) DC power output wire
  - Connect the power plug to the AC outlet. When using the AC-C624, connect the power cord to the power plug beforehand.
- \*When the power switch is set to on, power is supplied to the camera.



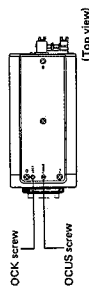
- Notes:**
- Be sure connect the power plug of the AC adaptor after completing all other connections. When connecting, be sure to turn the power off.
  - A mounting screw hole is provided in the bottom panel of the AC adaptor so that the camera can be installed on a tripod, etc. with the AC adaptor attached.
  - The AC adaptor cannot be installed on the top panel of the camera.
  - Read the instruction manual of the AC adaptor.

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## ADJUSTMENTS (LENS)

### Flange-back adjustment

When a lens is mounted, the adjustment of flange-back (the distance from the lens mounting place to the focal point) may sometimes be required. Adjust when focusing with the lens' focus ring is not possible.



#### With a fixed-focus lens

- Loosen the LOCK screw.
- Fully open the aperture and set the focus ring to "inf" (infinity).
- Turn the FOCUS screw to focus.
- When you obtain the possible best focus, tighten the LOCK screw to fix in that position.

#### Note:

- When focusing, point the camera at an object that is more than 2000 times the focal length of the lens away from the front of the lens. (For example, if the focal length is 7.5 mm, the object should be more than 15 m away from the camera.)

#### With a zoom lens

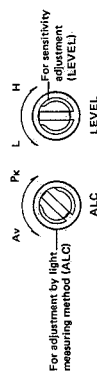
- Loosen the LOCK screw.
- Fully open the aperture and set the lens to the maximum telephoto position. Then turn the focus ring to focus.
- Set the lens to its maximum wide-angle position, and turn the FOCUS screw to focus.
- Repeat steps 2 and 3 until the difference between focusing positions 2 and 3 is smallest.
- When the best focusing point is found, tighten the LOCK screw to fix it.

#### Note:

- When focusing, point the camera at an object that is more than 5 times the minimum focal distance away from the lens. (For example, if the minimum focal distance is 1 m, the object should be more than 5 m away from the camera.)

### With an auto-iris lens (Example: JVC HZ-C7.5U (optional))

With an auto-iris lens that processes the images as an input signal, adjustment may be required.



For adjustment by light sensitivity adjustment method (ALC)

LEVEL

ALC

Av

Pk

L

H

For sensitivity adjustment (LEVEL)

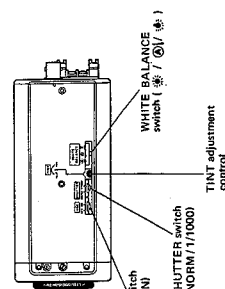
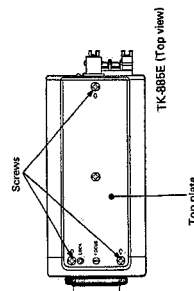
## ADJUSTMENTS

Adjust the camera settings depending on the conditions in which it is used. Adjustment controls located on the top of the camera include:

#### Adjustment/setting functions

- AGC (Automatic Gain Control) switch
- SHUTTER mode switch
- TINT adjustment control
- WHITE BALANCE mode switch

- When performing adjustments, loosen the three fixing screws to remove the top plate. Upon completion of adjustments, be sure to reinstall the plate.



AGC (Automatic Gain Control) switch  
This automatically increases camera's sensitivity when the level of ambient light drops.

ON: AGC activated.

OFF: AGC not activated.

#### Notes:

- When AGC is activated, the picture will become grainy.
- The AGC switch is set to ON when shipped.

### Sensitivity adjustment (LEVEL)

With an object which has comparatively low contrast under sufficient light (more than 1000 lux), adjust until the optimum brightness and gradations are obtained on the screen of the monitor.

With an object (which has comparatively low contrast) the appearance of which does not change with ALC adjustment, the contrast of the picture may appear to vary. In this case adjust the LEVEL control to obtain the optimum picture.

**L (counterclockwise):** Reduces the video signal level to make picture darker. (If the picture has too much contrast, turn to "H" side.)

**H (clockwise):** Increases the video signal level to make picture brighter. (If the picture has too little contrast, turn to "L" side.)

#### Notes:

- The LEVEL control is for adjustment of the level of the video signal, therefore do not turn it too often as this may degrade picture quality, lower sensitivity, or sometimes cause the lens to malfunction.
- Read the instruction manual of the lens in addition to these notes.

### Adjustment by light measuring method (ALC)

Choose the best light measuring method depending on the situation, and adjust to obtain the best possible picture while monitoring it.

**Av (counterclockwise):** For the average light measuring method. This measures the object's brightness to calculate the average level of the video signal to obtain the optimum iris setting automatically.

**Pk (clockwise):** For the peak light measuring method. It measures the object's brightness to calculate the highest brightness (peak) level of the video signal to obtain optimum iris setting automatically.

#### Notes:

- When halation occurs in part of a picture (the brightest part), turn to Pk side to prevent it.
- When the picture becomes too dark except for bright parts, turn to Av side to prevent it.
- If the picture tone does not change much even when the ALC control is turned, it indicates that the average measuring method is appropriate. In this case, adjust the LEVEL control for sensitivity adjustment.
- Read the instruction manual of the lens together with the notes.

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### Shutter mode switch

When shooting fast-moving objects, playback pictures will be blurred. The TK-885E incorporate a high-speed electronic shutter that allows switching the speed (the time the charge is stored) between 1/50 (normal) and 1/1000 second. At the higher speed, each frame is recorded with greater detail.

**NORM:** Normal 1/50 second (normal-speed shutter mode).  
**1/1000:** 1/1000 second (high-speed shutter mode).

#### Notes:

- The 1/1000-second setting requires more light than the normal-speed mode. It is recommended to use this mode in brightly lit conditions, such as outdoors with sunlight. (The sensitivity in the 1/1000 mode drops to approx. 1/20 that in the NORM mode.)
- In the 1/1000-second mode, shooting with artificial lighting (especially fluorescent light) will cause the pictures to flicker. Sweep horizontal or vertical bright lines which can often be seen with solid-state pickups may appear in the picture.
- This switch is set to NORM (normal 1/50 second) when shipped.

### White balance mode switch

This sets the camera's response so that pictures have correct colours with illumination with different colour temperatures. (For adjustment, use a colour video monitor which has been adjusted correctly.)

☀: For shooting under the natural (sun) light (colour temperature approx. 5500 K).

Ⓐ: Accepts different types of lighting (colour temperatures ranging from approx. 3000 K to 5000 K) using an automatic tracking system. (The TK-885E use a TTL system that measures light entering through the camera lens.)

Ⓐ: For shooting under the artificial light such as halogen lamps (colour temperature approx. 3200 K).

#### Notes:

- The automatic tracking system may not function properly when shooting with a special light source or the source with a colour temperature that exceeds the range of the camera. Because it uses a TTL system, if shooting a coloured object (especially one with a single colour) that fills most of the camera's area of view, the colour temperature may be judged incorrectly and the correct white balance adjustment may not be possible. In such a case, set to the ☀ or Ⓐ position.
- When the camera is to be used by installing on a rotating base for panning or tilting, it is recommended to set to the ☀ or Ⓐ position. If set to Ⓐ, it may cause unstable pictures since the white balance setting will change continuously.
- It is set to Ⓐ position when shipped.
- When using set to the ☀ or Ⓐ position, fine adjustment of the tint is possible to suit the conditions. (See next section.)

### Tint adjustment control

This allows fine-adjustment of tint. Adjust so that white objects displayed on video monitor are reproduced as white.

BLUE (counterclockwise): To give the picture a bluish tint.  
 RED (clockwise): To give the picture a reddish tint.

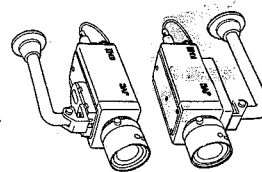
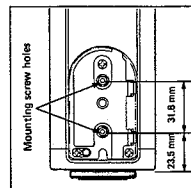
#### Notes:

- Before adjusting, check to see that the white balance switch is set to the ☀ or Ⓐ position. When set to the Ⓐ position, tint adjustment is not possible.
- Be sure the tint of video monitor used is adjusted correctly.

## INSTALLATION

The camera can be installed to a tripod, mounting bracket, etc., by securing either the top or bottom panel using the mounting screw holes (1/4"-20UNC) in the tripod mounting base.

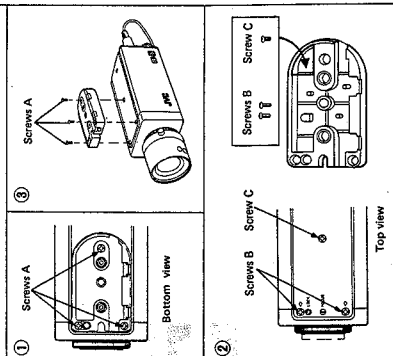
2 mounting screw holes are provided. In order to improve the strength of installation in special situations, use both holes.



The tripod mounting base is attached to the bottom panel when the camera is shipped. When the top panel is used for installation, reposition the base on the top panel.

#### Repositioning procedure

- ① Remove the three screws A to remove the tripod mounting base.
- ② Remove the two screws B and screw C. (Those screws are not used. Store them by screwing into the tripod mounting base.)
- ③ Attach the mounting base on the top panel with three screws A.



## SPECIFICATIONS

■	Provided accessory	■	Colour video camera head
	IRIS plug (3-pin) x 1		Based on PAL standard
	Lens mount cap x 1		Interline-transfer system CCD solid-state image sensor (Complementary color filter provided)
	C-mount adaptor x 1		Single CCD complementary colour system
	(The lens mount cap and C-mount adaptor are attached in place when shipping.)		
			No. of effective pixels
			500 (H) x 582 (V)
			4.6 (V) x 6.2 (H) mm (equivalent to 1/2" format)
			625 lines, 2:1 interlaced
			(H) 15.625 kHz (V) 50 Hz
			Internal
			Composite video signal/1 Vp-p, 75 ohms, unbalanced
			BNC connector
			47 dB (luminance signal, AGC switch set to "OFF", shutter mode set to "NORM")
			320 TV lines
			10 lux (f/1.4, AGC switch set to "ON", shutter mode set to "NORM")
			2000 lux (shutter mode set to "NORM")
			AGC (ON/OFF), shutter mode (NORM/1/1000), white balance mode (☀/Ⓐ/Ⓑ)
			Flange-back, tint

**Lens mount**  
 : C-mount (with C-mount adaptor)/CS-mount (without C-mount adaptor)  
**Power requirement**  
 : DC 2 V (±10%), ripple voltage 50 mV (max)  
**Power consumption**  
 : 3.5 VA (DC 12 V)  
**Operating temperature range**  
 : -10°C - +50°C  
**Operating humidity**  
 : Less than 90% RH (noncondensing)  
**Dimensions**  
 : Width: Approx. 64 mm  
 : Height: Approx. 62 mm (including tripod mounting base)  
 : Depth: Approx. 160 mm (including C-mount adaptor and cable clip)  
**Weight**  
 : Approx. 500 g (including C-mount adaptor)

■ **Provided accessory**  
 : Iris plug (3-pin) x 1  
 : Lens mount cap x 1  
 : C-mount adaptor x 1

(The lens mount cap and C-mount adaptor are attached in place when shipping.)

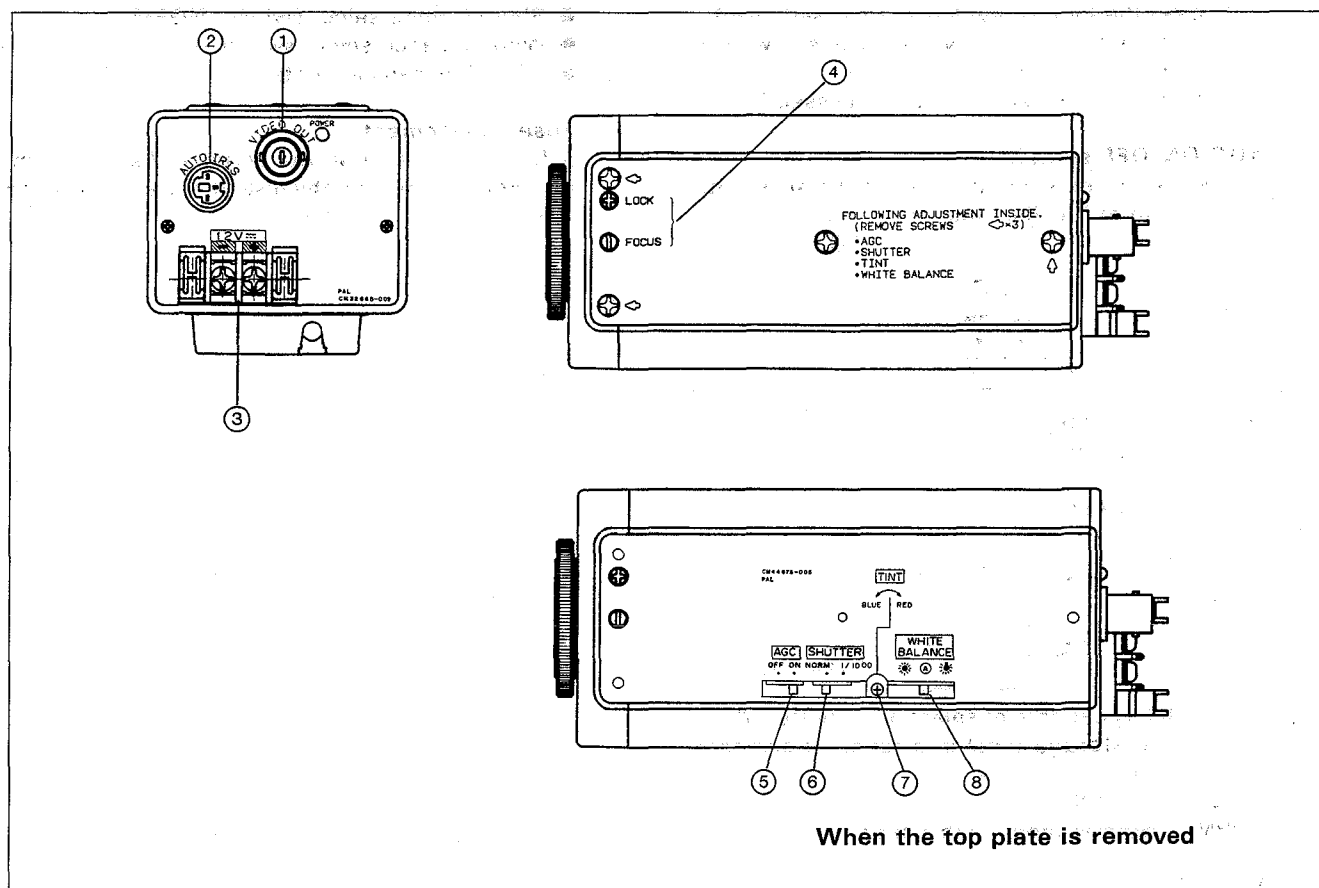
\*This colour video camera head is designed to output video signals conforming to the PAL standard, so that it cannot be used with video recorders or colour monitors which use colour systems other than PAL.

\*Design and specifications subject to change without notice.

**JVC**  
VICTOR COMPANY OF JAPAN, LIMITED

W PIONEER  
TK-885E-1BA ④ 1

# SPECIFIC SERVICE INSTRUCTIONS & PRECAUTIONS

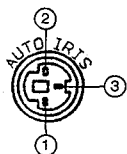


## EXTERNAL TERMINALS AND ADJUSTMENTS ON SETUP

### ① VIDEO OUT terminal

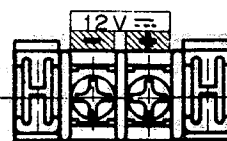
To this terminal, connected is the VIDEO IN terminal of a video monitor, a VTR, etc.

### ② LENS terminal



Pin No.	Signal
①	GND
②	VIDEO
③	DC9V-10V (50mA max)

### ③ Power terminal



### ● DC 12 V input terminals

**Note:** When 12V DC is used as a power supply, make sure the positive and negative terminals are connected correctly. A reverse in polarity may cause malfunction.

④ **Back focus adjustment screw**

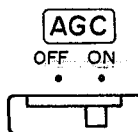
Of this camera, the back focus can be adjusted from outside.

- 1) Loosen the lock screw (cross recessed head).
- 2) Adjust the back focus by the focus screw. (For details, "Adjustment Procedures".)
- 3) Lock by the lock screw (cross recessed head).

⑤ **AGC ON/OFF switch**

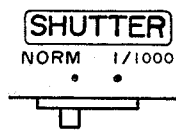
This switch selects whether or not the sensitivity is corrected at low illumination.

TOP VIEW



ON : AGC operation

OFF: no AGC operation

⑥ **Shutter mode select switch**

TOP VIEW

This switch is capable of selecting a shutter speed (signal load storage time) in a range of standard 1/50 sec. to 1/1000 sec.

1/1000: 1/1000 sec. mode

NORM: Normal mode (1/50 sec.)

⑦ **Tint VR**

This VR fine-adjusts the tint.

Use to externally adjust the tint (hue) caused by differences between different lenses and optical sources.

⑧ **White balance select switch**

This switch sets the color temperature according to the installation location of the camera head, as color temperature differs with installation location.



TOP VIEW

Switch position		Color temperature
INDOOR	☀	About 3200°K
OUTDOOR	☀	About 5500°K
AUTO WHITE	AW	About 3000°K ~ 6000°K

⑨ **Factory switch settings**

Switches are factory set as follows:

- AGC ON/OFF switch : ON
- Shutter mode select switch : NORM
- White balance select switch: A
- TINT: Mechanical center

⑩ **Fuse replacement**

A fuse is provided on the Terminal Ass'y (assembly). Before replacing the fuse, remove the AL Case Ass'y.

## ■ TWO-SIDE HOLE-THROUGH PC BOARD

A two-sided hole-through PC Board is used on this camera. Patterns and wires are designed extra thin to attain highdensity component mounting. Rough handling may damage the patterns/wires or other components. When disassembling, repairing or adjusting the PC boards, exercise care to avoid damage.

## ■ REPAIRING CIRCUIT BOARD MODULES

### (1) Removing circuit board module

Pull out the circuit board, after removing solder completely with a solder sucker.

#### NOTE:

- Take care not to damage or remove solder from other parts.
- If more than two circuit boards are removed, make sure that they are replaced in the proper position.
- Some circuit boards cannot be removed unless the shielding case and chassis frame have been removed. When removing any circuit board, check if this applies to the PC board.

### (2) Checking circuit board module

To check each circuit board, take out the module and extend with wires, etc.

## ■ REPLACING CHIP COMPONENTS

Use a soldering iron (temperature  $260^{\circ}\text{C} \sim 300^{\circ}\text{C}$ , about 17W) with a slim tip and high insulating ability. Those with a solder sucker (about 55W) are usually easier to use.

**NOTE:** This video camera uses many mini-flat ICs. To remove these, melt the solder while picking up the individual pin with fine tipped tweezers or cut off the IC pins. Take care not to scratch or peel off the BOARD foil pattern.

## ■ CHIP COMPONENTS DISPLAY

Besides the resistors, short jumpers, FET's, ceramic capacitors, transistors, and other chip components, the chip tantalum capacitors and chip variable resistor (CH VR) are used on the camera. None of these chip components are reusable again once they have been used.

**NOTE:** 1. Avoid rough handling of the VR.

2. Use a thin-tip insulated-type screwdriver to adjust the CH VR.

## ● How to read printings

On certain chip components, printing is applied as follows:

### ① Chip metal glaze resistor (CH MG R)

The diagram shown in Fig. A (A) is applied to some of these resistors.

**Reading method (Example)**

1 2 3 =  $12 \times 10^3$  Unit:  $[\Omega]$



### ② Shorting jumper (O $[\Omega]$ of CH MG R)

No diagram is applied to shorting jumpers. A "0" is printed on Type (A) shown in Fig. A.

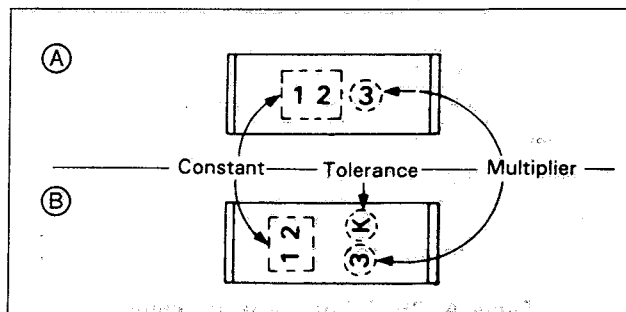


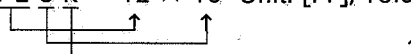
Fig. A Example of CH MG R/CH C Cap. codes

### ③ Chip ceramic capacitor (CH C Cap.)

- The diagram shown in Fig. A (B) is applied to some of the CH C Caps. On some others, there is no diagram that is of any use to users.

**Reading method (Example)**

1 2 3 K =  $12 \times 10^3$  Unit: [PF], Tolerance: K( $\pm 10\%$ )



- As shown in Fig. B some chip ceramic capacitors are represented by two digits. Table A shows how those figures should be read.

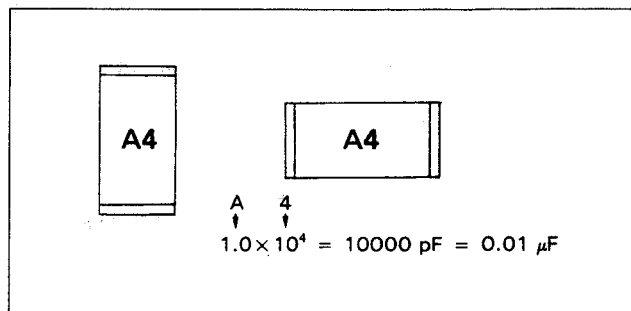


Fig. B Example of CH C Cap.

Alphabet	A	B	C	D	E	F	G	H	J	K
Constant	1.0	1.1	1.2	1.3	1.5	1.6	1.8	2.0	2.2	2.4
Alphabet	L	M	N	P	Q	R	S	T	U	V
Constant	2.7	3.0	3.3	3.6	3.9	4.3	4.7	5.1	5.6	6.2
Alphabet	W	X	Y	Z		a	b	d	e	f
Constant	6.8	7.5	8.2	9.1		2.5	3.5	4.0	4.5	5.0
Alphabet	m	n	t	y						
Constant	6.0	7.0	8.0	9.0						
Numeral	0	1	2	3	4	5	6	7	8	9
Multiplier	10 <sup>0</sup>	10 <sup>1</sup>	10 <sup>2</sup>	10 <sup>3</sup>	10 <sup>4</sup>	10 <sup>5</sup>			10 <sup>-2</sup>	10 <sup>-1</sup>

Table A CH C Cap. capacity value

## ④ Chip Variable Resistor (CH VR)

A two-digit code is printed on some CH VRs. They indicate a reading method, as shown in Table B.

Three-digit codes are also used. These codes are read in the same way as those for CH MG R.

## ⑤ Chip Tantalum Capacitor (CH Tan. Cap.)

The diagram shown in Fig.C is applied to some of the CH Tan. Caps.

## Reading method (Example)

The type shown in Fig.C is 10 $\mu$ F, 16WV chip tantalum capacitor.

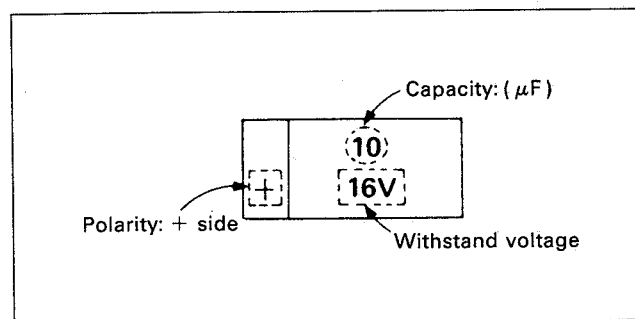


Fig. C Example of CH Tan. C Cap. codes

## ⑥ Chip Transistor

The labels shown in Table C are applied to the chip transistor.

Part No.	Display method
2SC2778(B,C,D)	<div> <div>(K) (B)</div> <div>denotes</div> <div>2SC2778 parts ranking: B</div> <div>K . C</div> <div>K . D</div> </div>
2SC2404(D)	<div> <div>U . D</div> </div>
2SD601(Q,R)	<div> <div>Y . Q</div> <div>Y . R</div> </div>
2SD601A(Q,R)	<div> <div>Z . Q</div> <div>Z . R</div> </div>
2SD1030(R)	<div> <div>1ZR</div> </div>
2SB709(P,R)	<div> <div>A . P</div> <div>A . Q</div> <div>A . R</div> </div>
2SB792(Q,T)	<div> <div>I . Q</div> <div>I . R</div> <div>I . S</div> <div>I . T</div> </div>
2SB970(Q,S)	<div> <div>1RQ</div> <div>1RR</div> <div>1RS</div> </div>
2SA1022(C)	<div> <div>E.C</div> </div>

Table C Chip transistor labels

## ⑦ Chip FET

The following printing is applied to the Chip FET.

Part No.	Display method
2SK198(Q,R)	<div> <div>(10) (Q)</div> <div>denotes</div> <div>2SK198 parts ranking: Q</div> <div>10R</div> </div>
2SK316	<div> <div>1KP</div> <div>1KQ</div> </div>

Table D Chip FET codes

## ⑧ Chip Diode

The following labels are applied to the Chip Diode.

Part No.	Display method
MA151WA	<div> <div>(M) N</div> <div>denotes</div> <div>MA151</div> </div>
MA151K	<div> <div>M . H</div> </div>
MA151WK	<div> <div>M . T</div> </div>
MA151A	<div> <div>M . A</div> </div>
MA157	<div> <div>M : R</div> </div>
MA3051	<div> <div>5.1</div> </div>
MA3120 (L-H)	<div> <div>12H</div> <div>12L</div> <div>12M</div> </div>

Table E The display of chip diode

Code	12	22	32	52	72	13	23	33	53	73	14
Resistance Value	100 $\Omega$	220 $\Omega$	330 $\Omega$	470 $\Omega$	680 $\Omega$	1k $\Omega$	2.2k $\Omega$	3.3k $\Omega$	4.7k $\Omega$	6.8k $\Omega$	10k $\Omega$
Code	24	34	54	74	15	25	35	55	75	16	
Resistance Value	22 k $\Omega$	33 k $\Omega$	47 k $\Omega$	68 k $\Omega$	100 k $\Omega$	220 k $\Omega$	330 k $\Omega$	470 k $\Omega$	680 k $\Omega$	1 M $\Omega$	

Table B CH VR resistance value display method in two-digit

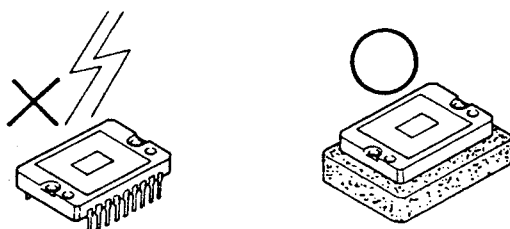


## ■ "CHARGE COUPLED DEVICE (CCD)" IMAGER

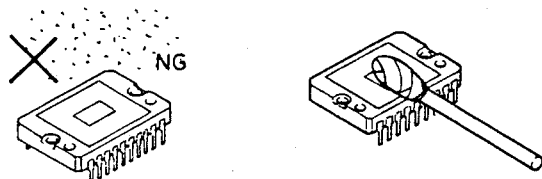
### 1. Precautions for handling and replacing CCD imager

CCD is characteristic of many advantages, but it also has some disadvantages. The following are measures to deal with these disadvantages.

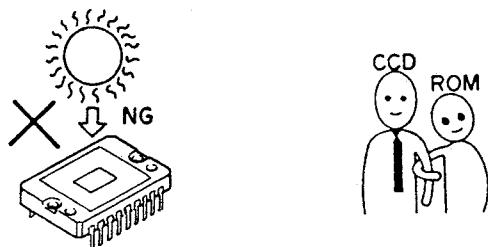
- (1) CCD imager is a circuit element which is very sensitive to static electricity.
  - The potential differences caused by the electrostatic charge – which have been accumulated in the clothing and human body – sometimes destruct the insulation of the CCD imager. Therefore, handle the "high-priced" CCD imager with more attention thereto than to the C-MOS (Complementary MOS), especially during the dry season and in dry places.



- Maintain the CCD imager in the provided pack or aluminum foil so that it can be kept at the same potential. Never unpack its container until the very moment of servicing.
- (2) The CCD imager is easily damaged by dust. Also it suffers considerable deterioration, when exposed to strong light.
- When servicing, make sure that the CCD imager is kept free from such foreign material as dust. Use dry soft cloth or soft cloth moistured with ethylalcohol to wipe off the foreign material.



- Do not exposed the CCD imager to such strong light as direct sunlight.



- (3) The CCD imager is damaged instantly by the following malfunctions. Pay close attention to these malfunctions before servicing.

- ① After removal of CCD, charge may remain at each terminal in the circuit side for some time. In this situation, when CCD is inserted to the socket, CCD may be distracted instantaneously due to the charge. To avoid this, CCD should be inserted with passage of some time (2 to 3 minutes) after removal.
- ② The output terminal of the pin (11) is short-circuited.
- ③ The PD (pre-charged drain bias) terminal of the pin (15) has turned negative.

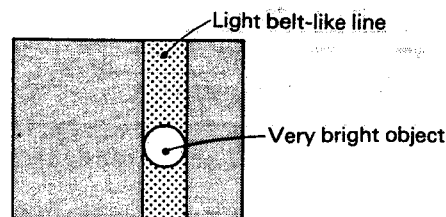
## ■ SPECIAL CHARACTERISTICS OF A CCD

The following phenomena can be expected when using the video camera with the CCD imager; they are not malfunctions.

### • Smear phenomenon

This phenomenon occurs when shooting a very bright object (such as electronic light, fluorescent lamp, the sun or a strong reflection).

Video monitor screen



Due to the interline-transfer organization of the CCD image sensors (Refer to "The Interline-transfer Organization of the CCD Image Sensors"), this phenomenon is caused by electronic charges generated beneath the photosensors by a light with a long wavelength, such as an infrared light.

In the shutter mode, as the signal level drops down to 1/20, the smear level becomes high relatively. However, this means no failure.

### • False signal

When vertical stripes or straight lines are shot, they may look wavy.

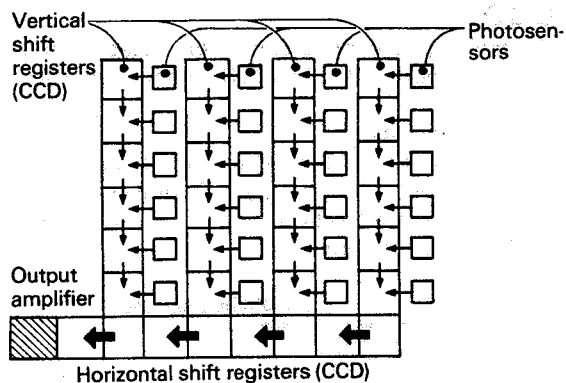
### • Blemishes

The photosensor elements generate electronic charges which ultimately produce horizontal and vertical rows in the CCD image sensor.

Therefore, any malfunctioning photosensor element will eventually cause a blemish on the monitor screen.

**The interline-transfer organization of CCD image sensors**

This CCD video camera module adopts an interline transfer organization in which precisely aligned photosensors and vertical shift registers are arrayed interlinearly and horizontal shift register links up with the vertical shift register, as shown. Light variations are sensed by the photosensors, which generate electronic charges proportional to the light intensity. The generated charges are fed into the vertical shift registers all at one. The charges are then transferred from the vertical shift registers to the horizontal shift registers successively and finally reach the output amplifier to be read out successively.



## REMOVING EACH PART

### ■ Disassembling/Replacing Each Part

- Before disassembling each part, be sure to turn off the power.
- When disassembling or replacing, be sure to attach the dust cap to protect the CCD imager and the optical low pass filter. (Remove the C mount adaptor.)

#### 1-1 Removing the top plate

- (1) Remove the four screws ① shown in Fig. 1 and take out the top cover.

#### 1-2 Removing the tripod base

- (1) Remove the three screws ② shown in Fig. 1 and take out the tripod base.

#### 1-3 Removing the terminal plate and the rear mold frame

- (1) Remove the two screws ③ shown in Fig. 1 and take out the terminal plate and the rear mold frame.

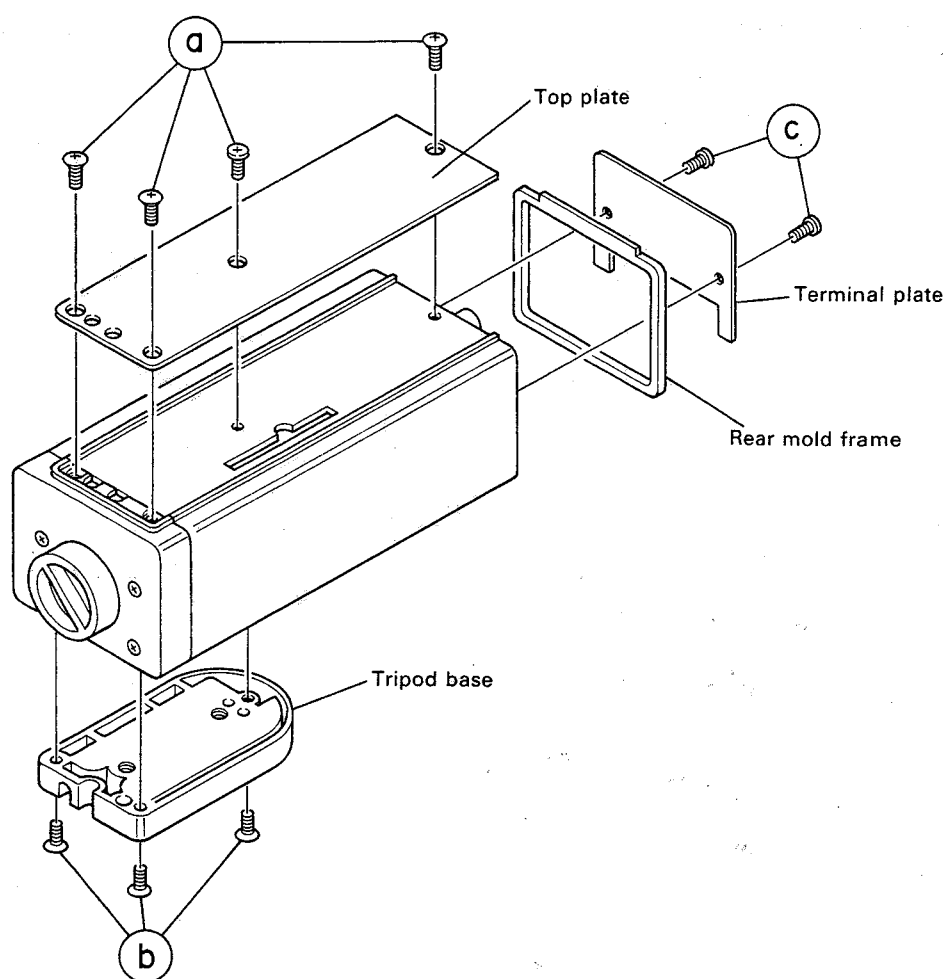


Fig. 1

**2-1. Removing the AL case assy**

- (1) Perform items 1-1 to 1-3.
- (2) Remove the two screws ① shown in Fig. 2.
- (3) Pull the case in the direction of the arrow ③ as shown in Fig. 2, and the AL case assy will be detached.

**2-2. Removing the front diecast**

- (1) Remove the four screws ④ shown in Fig. 2 and take out the front diecast.

**Notes:**

- The front diecast cannot be detached unless the top plate and the tripod base are removed in advance.
- The front diecast cannot be detached with the C mount adaptor kept attached.

**2-3. Opening the PC boards**

- (1) Remove the two screws ⑤ shown in Fig. 2, and the PC boards at the both sides will be opened in the direction of arrow ⑥. The boards will be detached when further opened.

In addition, when installing them, place them in level with each other and insert their respective connectors to each other. (Push them in fully as shown in Fig. 2-a.)

**2-4 Removing the chassis mount**

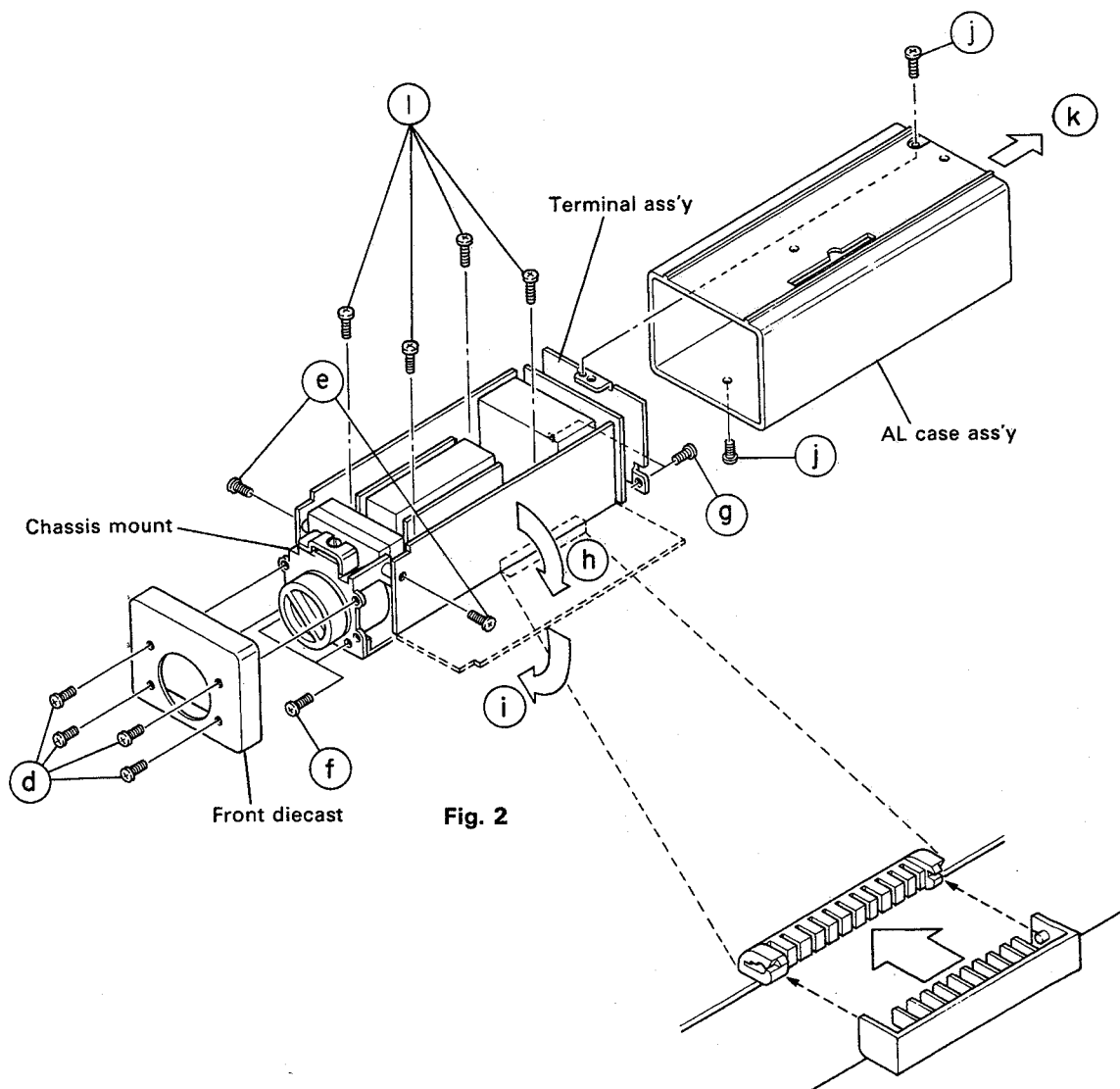
- (1) Remove the two screws ⑦ shown in Fig. 2 and take out the chassis mount. (Disconnect the grounding wire and the connectors.)

**2-5 Removing the terminal assy**

- (1) Remove the two screws ⑧ shown in Fig. 2 and take out the terminal assy. (Disconnect the grounding wire and the connectors.)

**2-6 Removing the chassis frame**

- (1) Remove the four screws (1) shown in Fig. 2 and take out the chassis frame.
- (2) When the chassis frame is removed, the Mother board can also be removed. (Disconnect the GND wire and connectors before taking the circuit board out.)

**Fig. 2****Fig. 2-a**

### 3. Disassembling the CCD imager

- (1) Detach the imager section from the chassis in accordance with "2-4 Removing the chassis mount".
  - (2) Remove the two nuts (A) shown in Fig. 3, and take out the imager board in the direction of the arrow.
  - (3) Remove the two screws (B) shown in Fig. 3, and the imager holder section and the chassis mount section will be detached.
  - (4) Remove the two screws (C) shown in Fig. 3, and take out the LPF holder.
  - (5) Remove the two screws (D) shown in Fig. 3, and take out the CCD imager.
- At this time, be careful not to lose the imager mask.

### 4. Removing the optical low pass filter (OP-LPF ass'y)

The optical low pass filter can be removed without removing any external parts such as the AL case ass'y, etc.

Take out the dust cover and remove the two screws (C) shown in Fig. 3, and the LPF holder will be released so that the optical low pass filter can be detached.

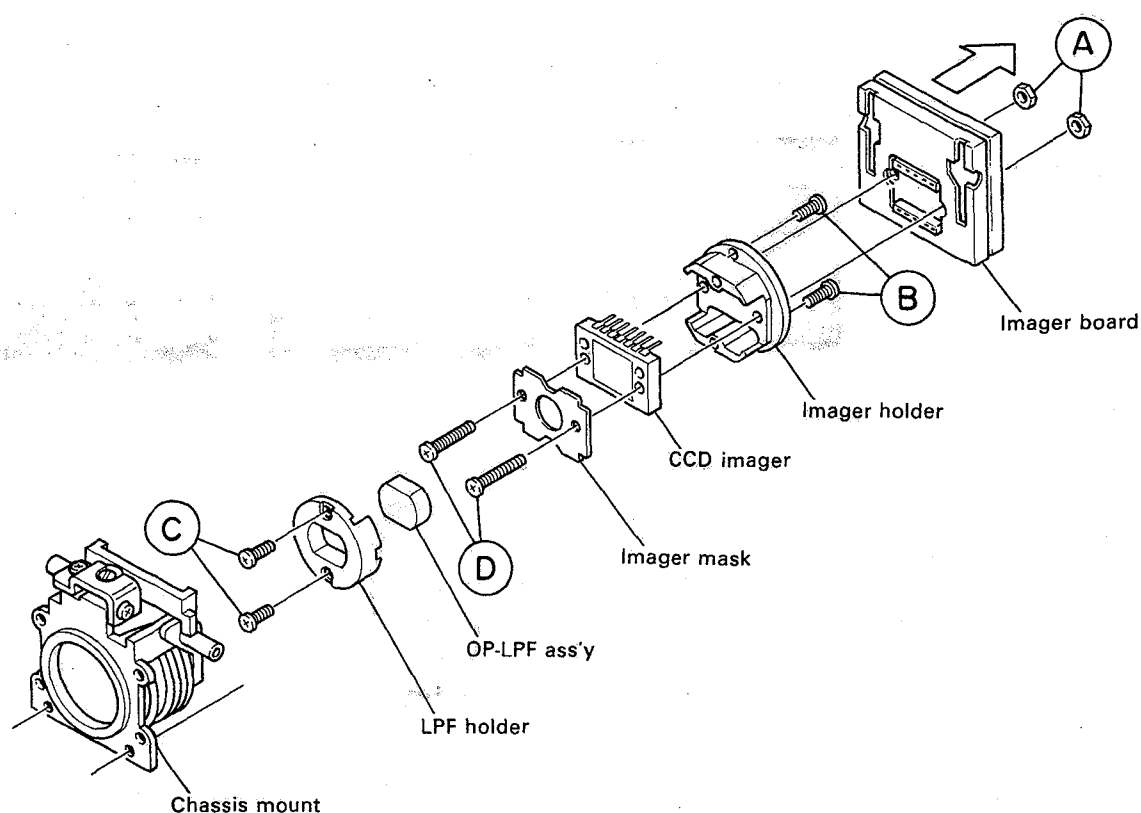


Fig. 3.

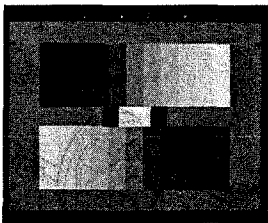

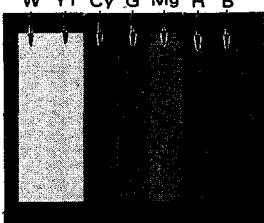
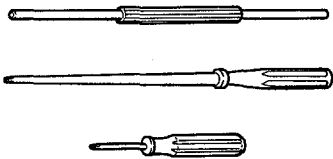
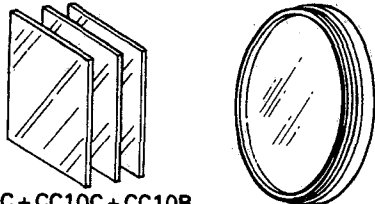
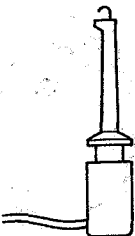
## 2. ADJUSTMENT

### MEASURING INSTRUMENTS, TOOLS AND FIXTURES FOR ADJUSTMENT

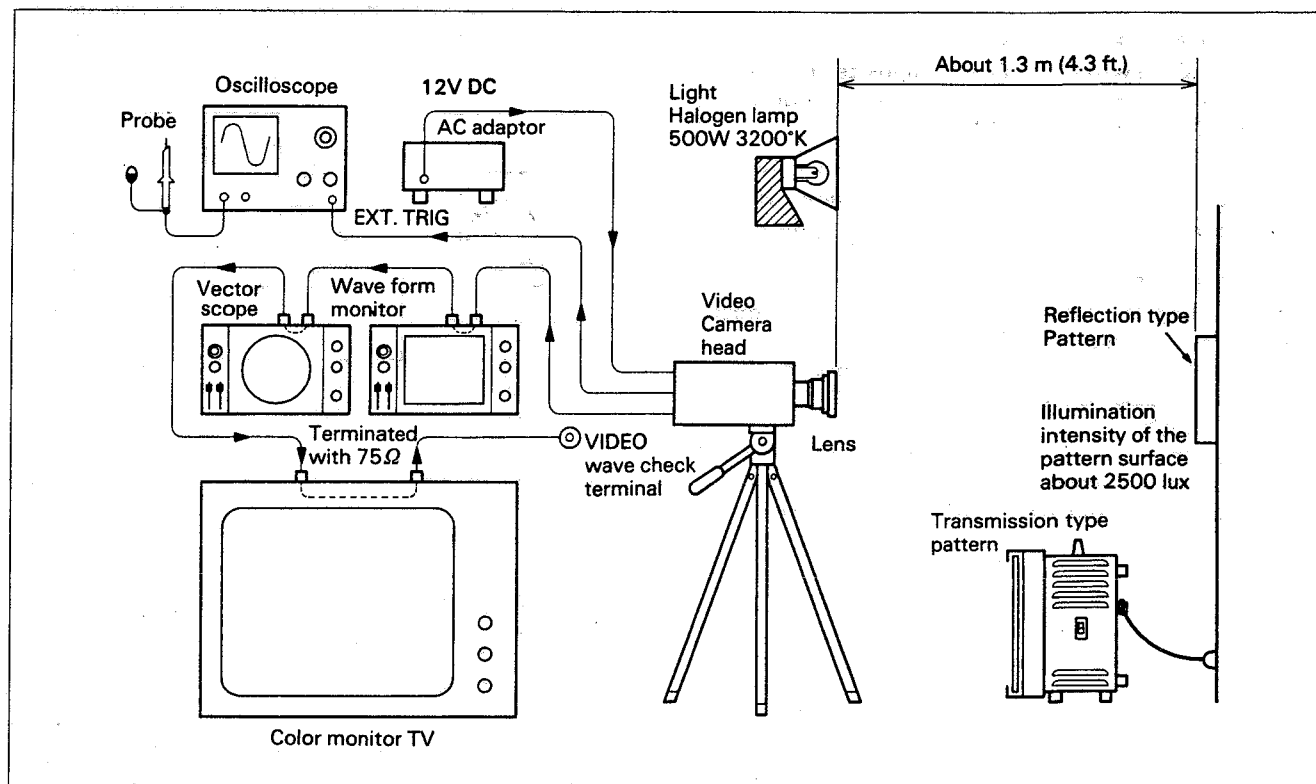
#### ■ MEASURING INSTRUMENTS

- |                                    |        |  |   |
|------------------------------------|--------|--|---|
| 1. Oscilloscope.....               | 1      | 6. Power supply.....                               | 1 |
| 2. Color monitor TV.....           | 1      | Voltage: 12 V DC                                   |   |
| Color temperature: 9,300K          |        | VTR power, AC adaptor or AC adaptor + Camera Cable |   |
| 3. Lights.....                     | 1 or 2 | 7. Vectorscope (PAL-type).....                     | 1 |
| Color temperature: 3,200K          |        | Used only if necessary.                            |   |
| 4. Frequency counter.....          | 1      | 8. Waveform monitor (PAL-type).....                | 1 |
| 5. DIGITAL DC voltmeter (DVM)..... | 1      | Used only if necessary.                            |   |

#### ■ TOOLS AND FIXTURES

1. Patterns	(Gray scale pattern)	(White pattern)	(Color bar pattern)
<b>Note:</b> Reflection-type patterns eventually suffer from drops in signal output level or loss of output uniformity. Periodic replacement is recommended.			
			
	<b>GS-2A*</b> Reflective type ( $\gamma=2.2$ )	<b>WC-2A*</b> Reflective type	<b>CC-2T*</b> Transmissive type
<b>2. DRIVERS</b>	<b>3. COLOR TEMP. CONVERSION FILTER</b>		<b>4. PIN CLIP</b>
 Adj. driver	 80C + CC10C + CC10B W10, C8 Kenko, HOYA filter, W10, C8, KODAK Wratten gelatin filter, 80C, CC10C, CC10B		 MJ-033* Slightly bending the pin tip facilitates its use.
<b>5. LENS</b>			
C-mount lens or CS-mount lens. Iris can be controlled manually.  ● Lens flange-back should be standard ● Zoom lens is recommended ● F1.4 lens is recommended.	<b>Note:</b> Parts marked with an asterisk (*) can be ordered from the following section: PARTS SECTION OF THE SALES ENGINEERING DEPARTMENT, TELEVISION RECEIVER DIVISION. Parts that is not marked with asterisk (*) are able to get at your side.		

## INSTRUMENT CONNECTION AND SETUP



## PRIOR TO STARTING ADJUSTMENT

### (1) Warming up

Before adjustment, turn on the camera to warm it up for more than 10 minutes so that the camera operation may be stabilized.

### (2) Lighting

- Adjust the distance between the light and pattern so that the illumination on the pattern is about 2,500 lux and the illumination over the entire pattern surface is as uniform as possible.

- Correct adjustment will be impossible if the illumination is too high, too low or uneven.

### (3) About CCD Imager

The CCD image is susceptible to static electricity. The insulator of this element might be damaged if a potential difference is caused by the electrostatic charge carried by clothes or body. Be careful when holding it because it is costly. Use special care in a dry atmosphere in a dry season.

## ADJUSTMENT PROCEDURES

### 1. Presetting

Before adjustment, preset the following switches:

- 1) TINT VR → Mechanical center
- 2) AGC switch → "OFF" (opposite to lens)
- 3) White Balance switch → "★" (in-door)
- 4) SHUTTER → "NORM" (OFF)

2. In holding a test pin with a probe, take care set contact with any other pin. The CCD imager will be damaged if some text pins are accidentally connected.

### 3. EXT. TRIGGER

In adjusting the signal system, extract the trigger signal as required.

H-rate: TP-26 (ID) [PROCESS Board]

V-rate: Module [C], Pin ⑨ [SSG Board]

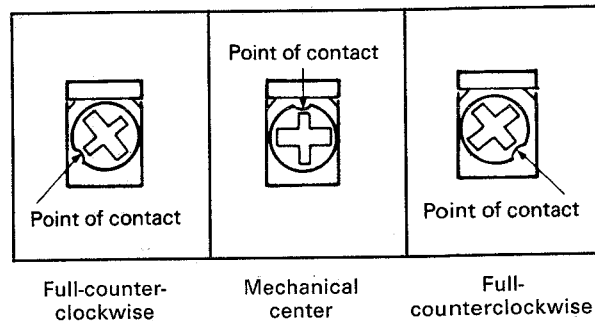
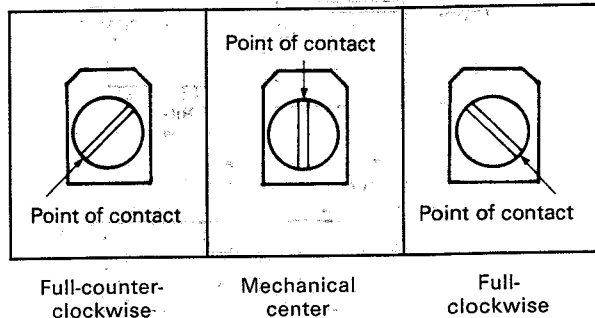
### 4. JUST SCAN

Unless otherwise specified, apply "just scan" to all pattern adjustments.

5. Repeat adjustments optimum conditions are established.

### 6. Chip VR

Chip VR rotating position is designated as shown in the figure below for the convenience of explanation, since the chip VR can be rotated 360°.

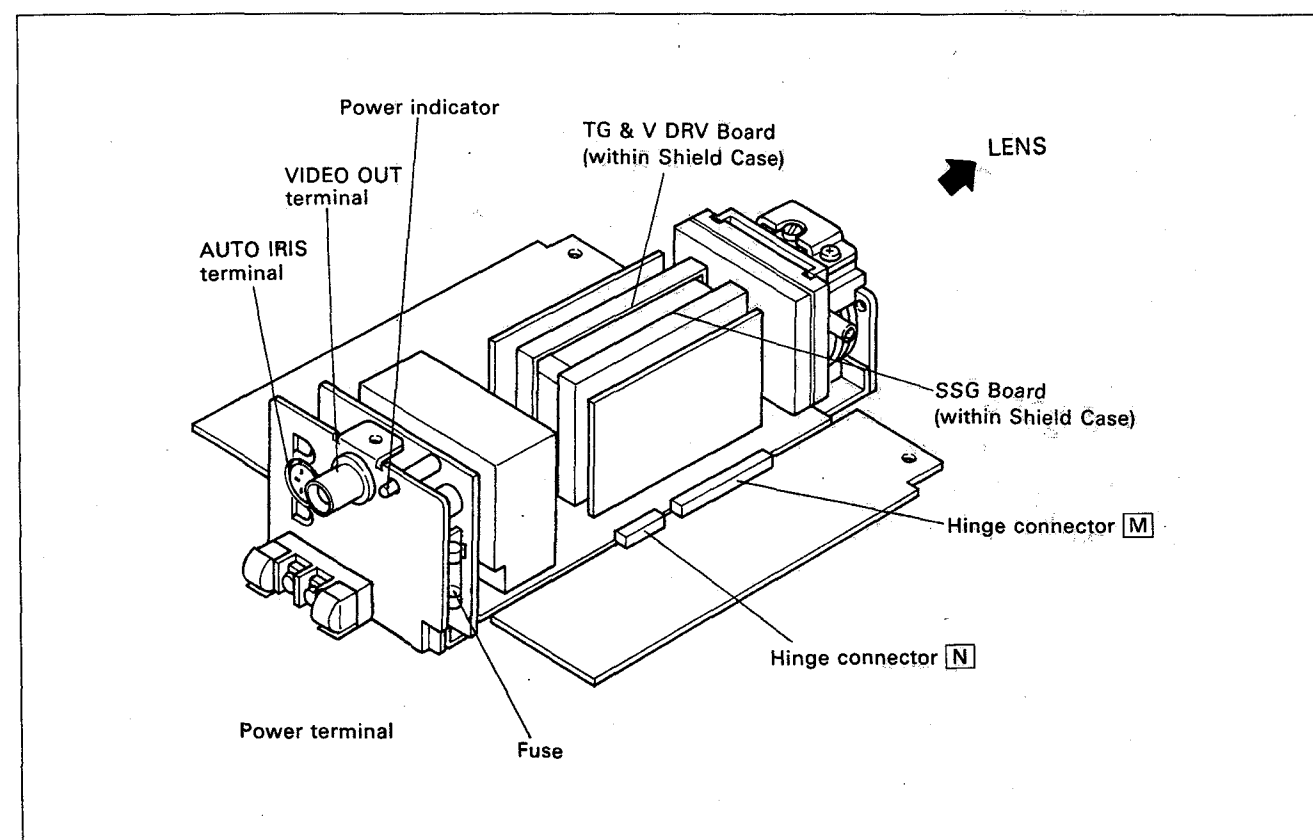
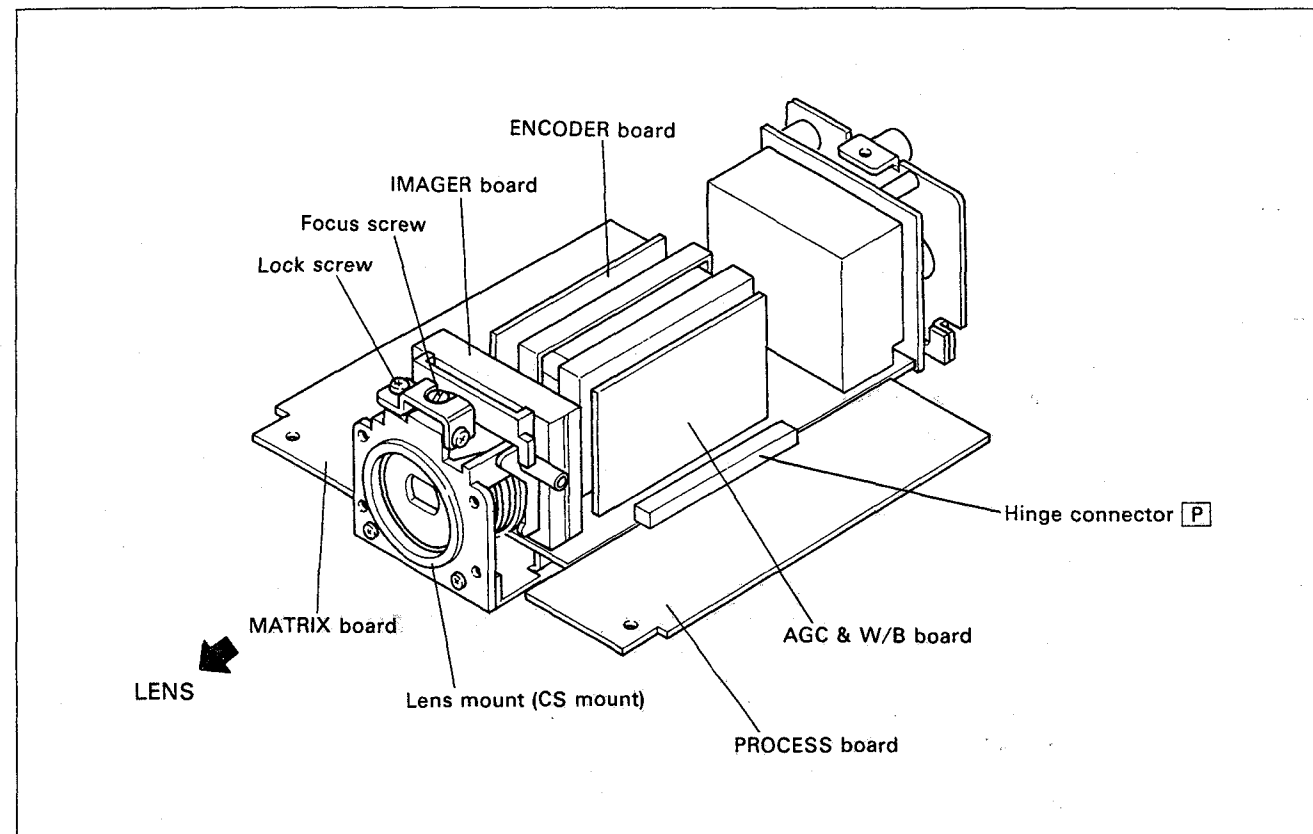


### 7. No Adjustment of unspecified VRs

Never rotate VR's other than those specified by this Instruction Manual.



## MAIN PARTS ARRANGEMENT AND LOCATIONS OF BOARDS

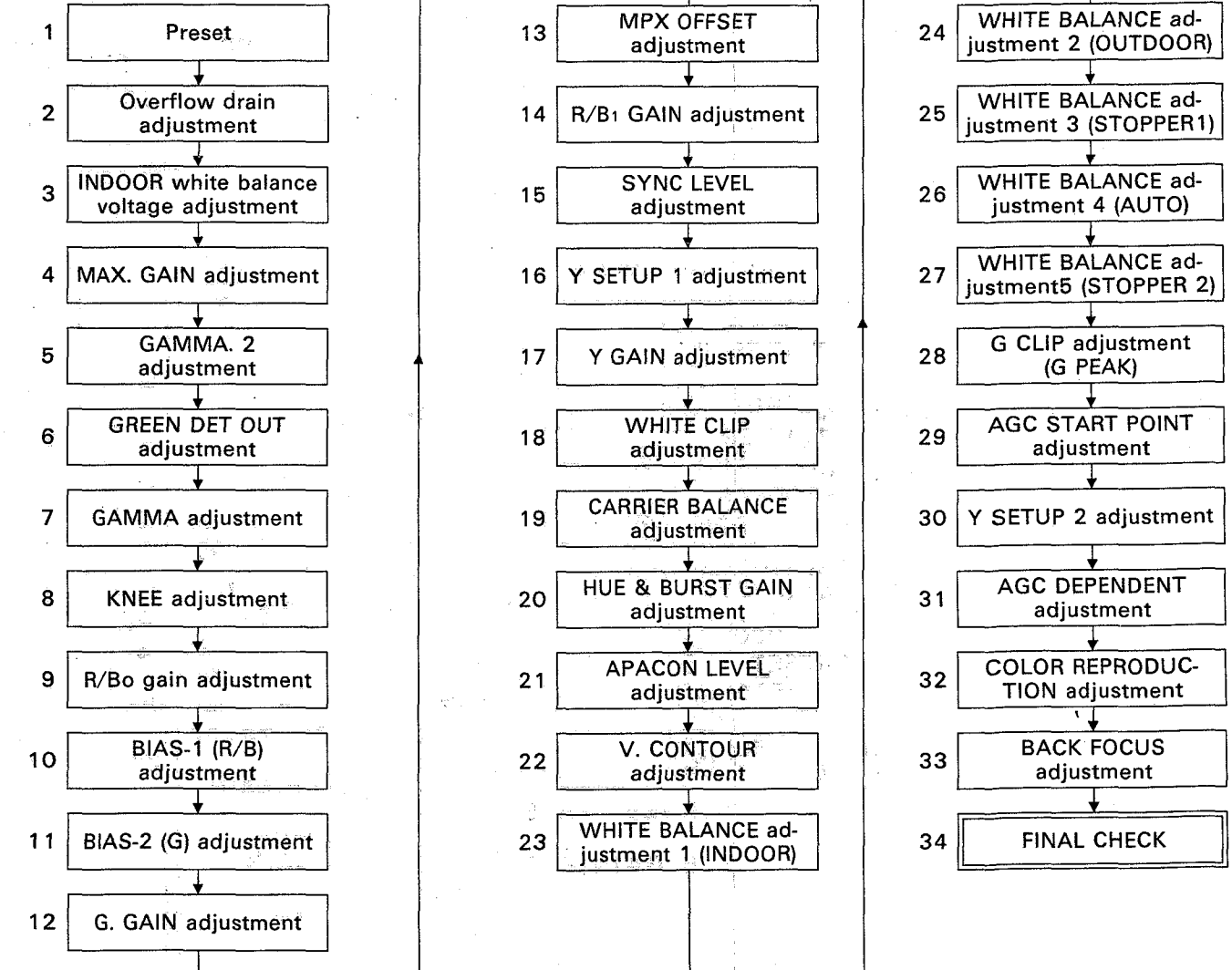


## ADJUSTING STEP

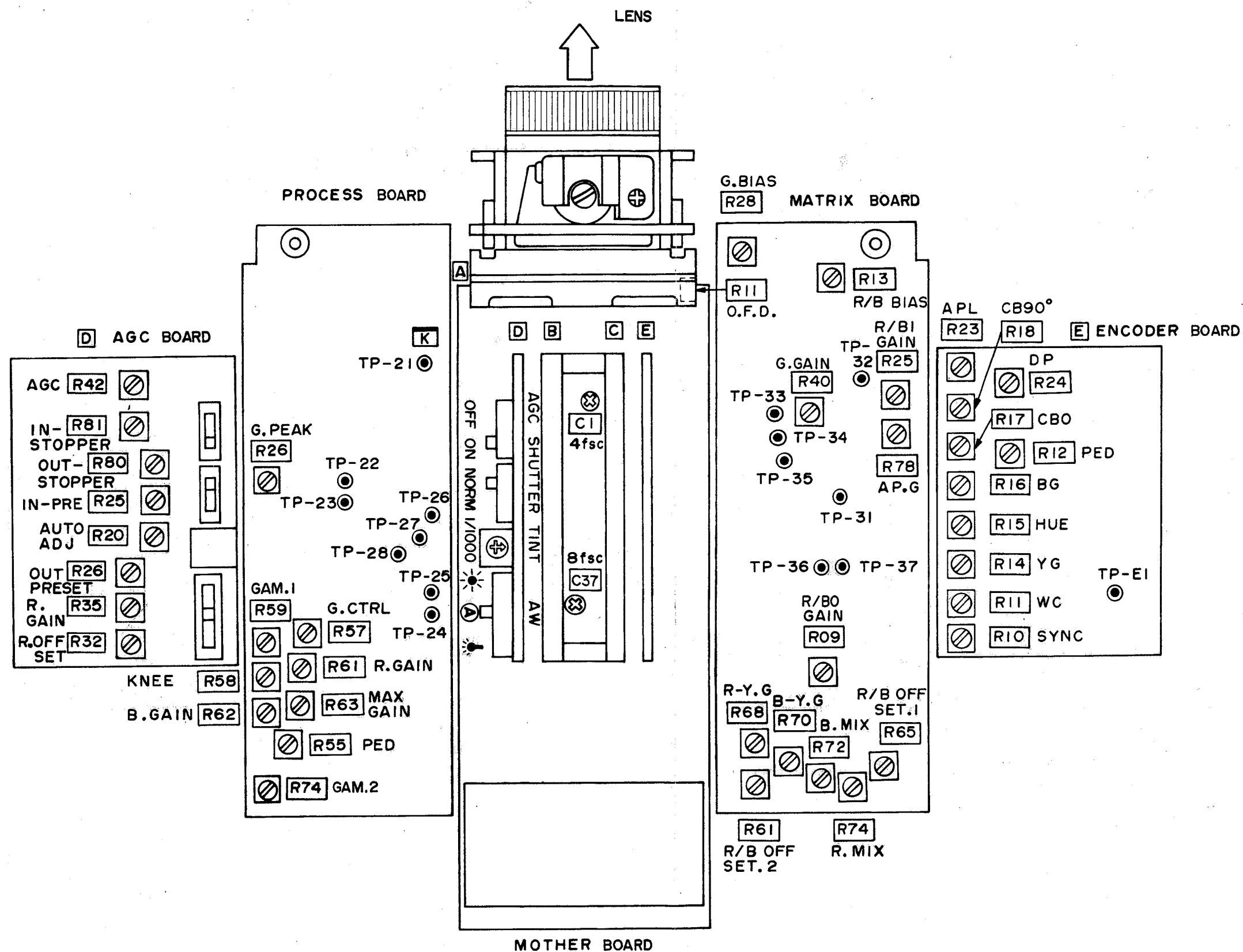
### 1. SSG (Synchronous Signal Generator) adjustment

Note: Normally, this adjustment is not necessary. Proceed to the next "Signal system adjustments" directly.

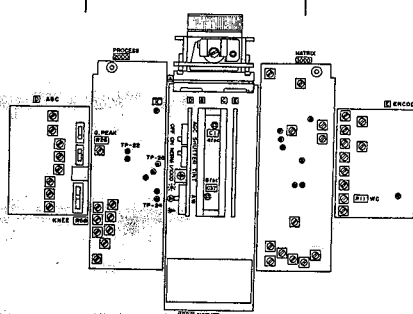
### 2. Signal system adjustments



ADJUSTMENT LOCATION

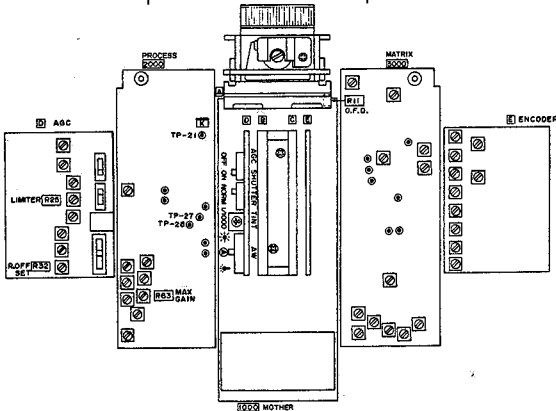
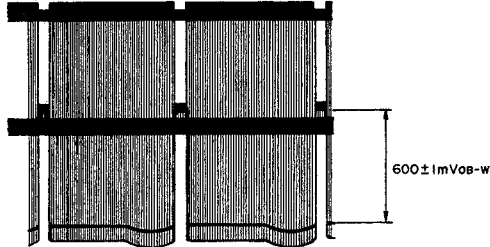


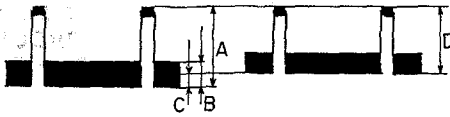
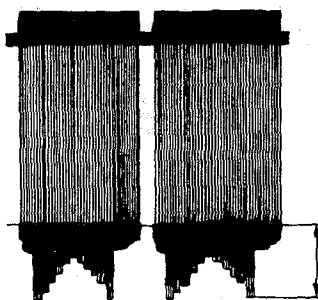
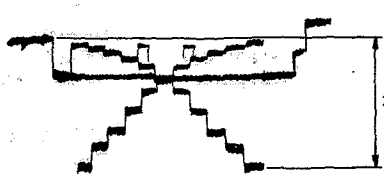
## 1. SSG ADJUSTMENT

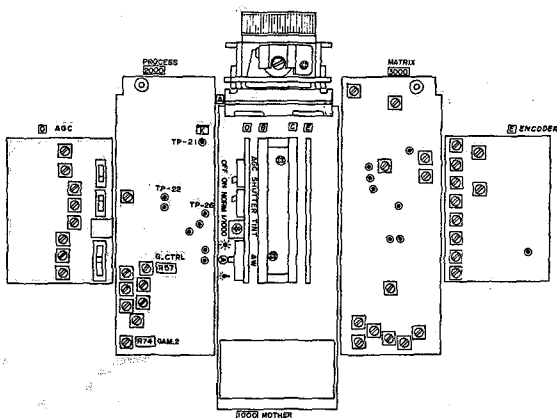
No.	Item	Measuring instrument & pattern	Test point	Adjustment part	Description
1.	8fsc & 4fsc adjustment	<div>This adjustment should be performed only when the SSG IC or a peripheral unit required for adjustment is replaced.</div> <div>● Normally, this adjustment is unnecessary. Proceed directly to "2. SIGNAL SYSTEM ADJUSTMENTS" directly.</div> <div><div>Frequency counter</div><div>Module [C], Pin ①</div><div>C01 (4fsc) C02 (4fsc-2) (within shield case)</div></div> <div><div>DC voltmeter</div><div>Module [C], Pin ② [SSG Board]</div><div>C37 (8fsc)</div></div> <div></div> <div><div>1. While measuring the frequency at pin ① of Module [C], adjust C01 (4fsc) so that the frequency counter reads 17.734475 MHz ± 10 Hz.</div><div>2. When measuring the voltage at pin ② of Module [C], adjust C37 so that the DC voltmeter reads 2.5 V ± 0.1V.</div><div>Note: In the above adjustment, when the required frequency is not obtained, perform the following adjustment:</div><div>1. Set C01 (4fsc) to the center.</div><div>2. While measuring the frequency at pin ① of Module [C], adjust C02 (4fsc-2) in the shielded case so that the frequency counter reads 17.734475 MHz ± 10 Hz.</div><div>3. While measuring the voltage at pin ② of Module [C], adjust C37 (8fsc.) so that the DC voltmeter reads 2.5 V ± 0.1 V.</div></div>			

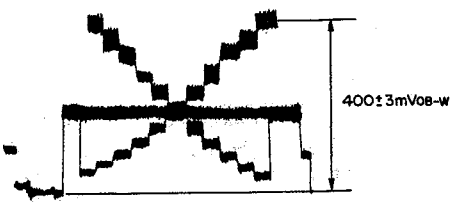
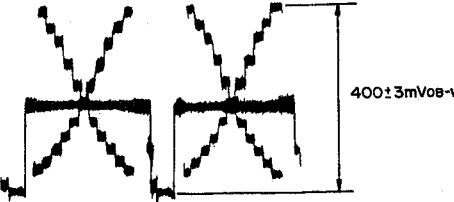
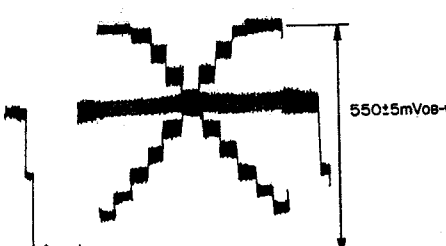
## 2. SIGNAL SYSTEM ADJUSTMENTS


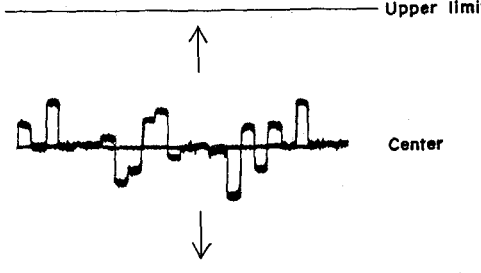
No.	Item	Measuring instrument & pattern	Test point	Adjustment part	Description
1.	PRESET	<p>Oscilloscope [H-rate 10:1]</p> <p>Gray scale pattern</p>	<p>TP-24 [PROCESS Board]</p> <p>TP-22 [PROCESS Board]</p> <p>VIDEO OUT ● EXT TRIGGER, TP-26 (ID) [PROCESS Board]</p>	<p>R58 (KNEE) R26 (G. PEAK) [PROCESS Board]</p> <p>R11 (W.C) [ENCODER Board]</p>	<p>Before adjustment, preset the following items:</p> <ol style="list-style-type: none"> <li>1) TINT VR → Mechanical center</li> <li>2) AGC switch → OFF</li> <li>3) White balance select switch → ☼ (INDOOR)</li> <li>4) SHUTTER mode select switch → "NORM" (OFF)</li> </ol> <p>Open the iris sufficiently.</p> <p>■ KNEE cancel While observing the waveform at TP-24, adjust R58 (KNEE) so that its amplitude is maximized.</p> <p>■ W. CLIP cancel While observing the waveform at VIDEO OUT, adjust R11 (W.C) so that its amplitude is maximized.</p> <p>■ G. CLIP cancel While observing the waveform at TP-22, adjust R26 (G. PEAK) so that its amplitude is maximized.</p>

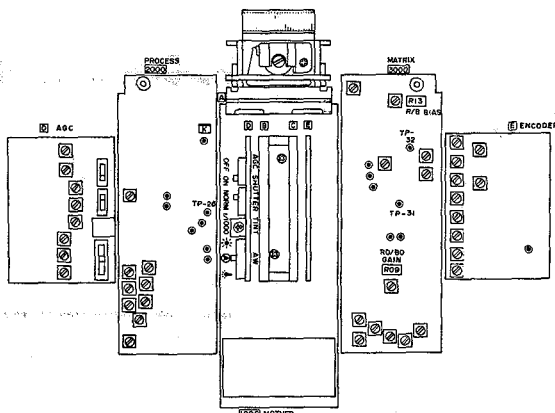
No.	Item	Measuring instrument & pattern	Test point	Adjustment part	Description
2.	OVER-FLOW DRAIN adjustment	Oscilloscope [V-rate 10:1]  White pattern	● EXT TRIGGER Pin ⑨ Module [C] [SSG Board]  TP-21 [PROCESS Board]	R11 (O.F.D) [IMAGER Board]	● Open the iris sufficiently. 1. Approach a light (3200°K) to the white pattern, and adjust so that the illumination on the pattern surface is 10000~20000 lux. (1kW halogen lamp is used. The distance between the pattern and the lamp light is about 60 cm.) At this time, pay attention to the white pattern luminance slope. 2. While observing the waveform at TP-21, adjust R11 (O.F.D) so that the waveform is $600 \pm 1$ mVob-w. (Fig. 2-1) <b>NOTE:</b> When the maximum waveform is not more than 620 mVob-w, the quantity of light is not sufficient.
					 <p>Fig. 2-1</p>
3	INDOOR WHITE BALANCE VOLTAGE adjustment	DC voltmeter	TP-27 [PROCESS Board] or pin ⑬ of hinge connector [P]  Pin ⑭ of hinge connector [P]	R32 (R. OFFSET) R25 (IN-PRE) [AGC Board]	1. Set the TINT VR to the mechanical center. 2. While measuring the voltage at TP-27 or pin ⑬ of hinge connector [P] by the DC voltmeter, adjust R32 (R. OFFSET) so that its reading is $2.35 \pm 0.005$ V. 3. While measuring the voltage at pin ⑭ of hinge connector [P] by the DC voltmeter, adjust R25 (IN-PRE) so that its reading is $2.7 \pm 0.005$ V.
4.	MAX. GAIN adjustment	DC voltmeter	TP-28 [PROCESS Board]	R63 (MAX. GAIN) [PROCESS Board]	1. While measuring the voltage at TP-28 by the DC voltmeter, adjust R63 (MAX. GAIN) so that its reading is $2.65 \pm 0.01$ V.

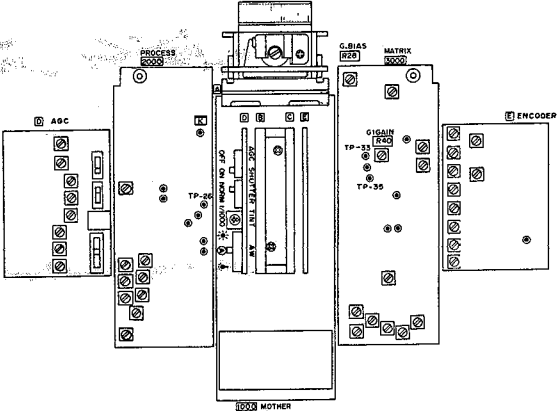
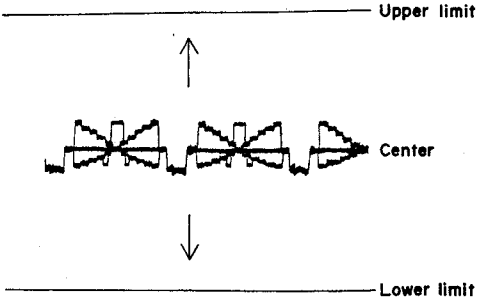

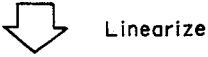

No.	Item	Measuring instrument & pattern	Test point	Adjustment part	Description
5	GAMMA2 adjustment	Oscilloscope (H-rate) 10:1	Pin ① of IC02 [PROCESS Board] ● EXT TRIGGER TP-26 (ID) [PROCESS Board]	R74 (GAM2) [PROCESS Board]	<ul style="list-style-type: none"> <li>● Close the iris with the lens cap.</li> <li>1. Measure the voltage pin at ① of IC02, and adjust so that the amplitude of the waveform of R74 (GAM 2) becomes maximum (A), as shown in Fig. 5-1.</li> <li>2. Adjust R74 (GAM 2) so that the amplitude at section (C) becomes half the level of (B) as shown in Fig.5-1.</li> </ul>  <p><math>C = \frac{B}{2} \Rightarrow D = A - C</math></p> <p>Fig. 5-1</p>
6.	GREEN DET OUT adjustment	Oscilloscope (H-rate) 10:1  Gray scale Pattern	TP-21 (CCD OUT) TP-22 (GDET OUT) [PROCESS Board]  ● EXT TRIGGER TP-26 (ID) [PROCESS Board]	R57 (G. CTRL) [PROCESS Board]	<ul style="list-style-type: none"> <li>■ Standard iris setting</li> <li>● While observing the waveform at TP-21, adjust the iris control knob (lens side) so that the CCD OUT waveform is <math>150 \pm 1</math> mVob-w as shown in Fig. 6-1.</li> </ul>  <p><math>150 \pm 1 \text{ mVob-w}</math></p> <p>Fig. 6-1</p> <p>1. While observing the waveform at TP-22, adjust R57 (G. CTRL) so that the waveform is <math>300 \pm 1</math> mVob-w as shown in Fig. 6-2.</p>  <p><math>300 \pm 1 \text{ mVob-w}</math></p> <p>Fig. 6-2</p>



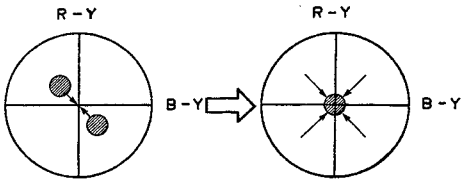
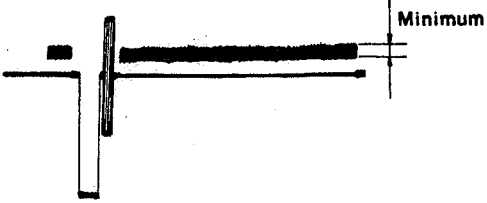
No.	Item	Measuring instrument & pattern	Test point	Adjustment part	Description
7.	GAMMA adjustment	Oscilloscope [H-rate 10:1]  Gray scale pattern	TP-24 (G GAMMA OUT)  TP-25 (R/B GAMMA OUT) [PROCESS Board]  ● EXT TRIGGER TP-26 (ID), [PROCESS Board]	R59 (GAM 1) R61 (R.GAIN) R62 (B. GAIN) [PROCESS Board]	<p>■ Standard iris setting</p> <p>● While observing the waveform at TP-21 by the oscilloscope, adjust the iris control knob (lens side) so that the CCD OUT waveform is <math>150\text{ V}\pm 1\text{ mVob-w}</math>.</p> <p>1. While observing the waveform at TP-24 by the oscilloscope, adjust R59 (GAM 1) so that the waveform is <math>400\pm 3\text{ mVob-w}</math> as shown in Fig. 7-1.</p>  <p>Fig. 7-1</p> <p>2. While observing the waveform at TP-25, adjust R61 (R. GAIN) and R62 (B. GAIN) so that their respective associated waveforms are <math>400\pm 3\text{ mVob-w}</math> as shown in Fig. 7-2. (Match the waveforms at TP-24 and TP-25 in level.)</p>  <p>Fig. 7-2</p>
8.	KNEE adjustment	Oscilloscope [H-rate 10:1]  Gray scale pattern	● EXT TRIGGER TP-26 (ID), [PROCESS Board] TP-24 (G GAMMA OUT) [PROCESS Board]	R58 (KNEE) [PROCESS Board]	<p>● Open the iris sufficiently.</p> <p>1. While observing the waveform at TP-24, adjust R58 (KNEE) so that the waveform is <math>550\pm 5\text{ mVob-w}</math> as shown in Fig. 8-1.</p> <p>Note: When the waveform at TP-24 is not more than 600 mV even with the iris opened, the illumination is not sufficient.</p>  <p>Fig. 8-1</p>

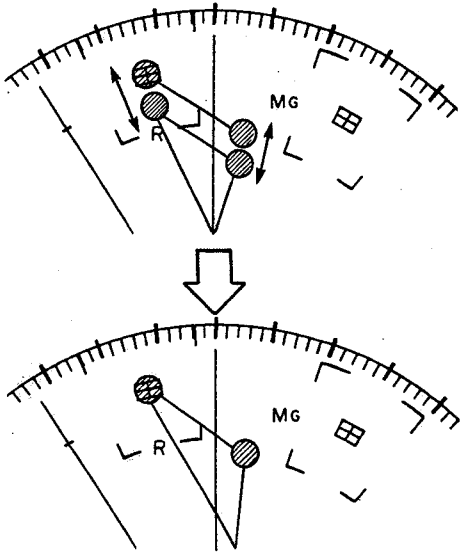
No.	Item	Measuring instrument & pattern	Test point	Adjustment part	Description
9.	R/Bo GAIN adjustment	Oscilloscope (H-rate) 10:1 Gray scale pattern	● EXT TRIGGER TP-26 (ID), [PROCESS Board]  TP-31 [MATRIX Board]	R09 (R/Bo GAIN) [MATRIX Board]	<p>■ Standard iris setting</p> <p>● While observing the waveform at TP-21, adjust the iris control knob (lens side) so that the CCD OUT waveform is <math>150 \pm 1 \text{ mVob-w}</math>.</p> <p>1. While observing the waveform at TP-31, adjust R09 (R/Bo GAIN) so that the waveform is linear as shown in Fig. 9-1.</p>  <p>Fig. 9-1</p>
10.	BIAS-1 (R/B) adjustment	Oscilloscope (H-rate) 10:1 Color bar pattern	● EXT TRIGGER TP-26 (ID), [PROCESS Board]  TP-32 [MATRIX Board]	R13 (R/B BIAS) [MATRIX Board]	<p>■ Standard iris setting</p> <p>● While observing the waveform at TP-21, adjust the iris control knob (lens side) so that the CCD OUT waveform is <math>150 \pm 1 \text{ mVob-w}</math>.</p> <p>1. While observing the waveform at TP-32, raise and lower the waveform by R13 (R/B BIAS) to adjust so that the waveform comes to the center between the upper and lower limit positions as shown in Fig. 10-1.</p>  <p>Fig. 10-1</p>

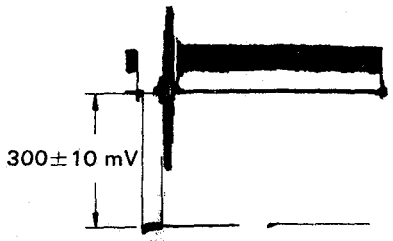

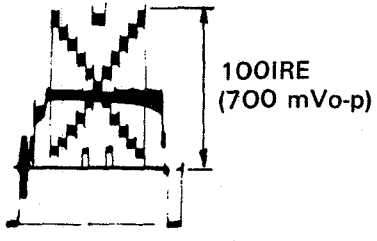


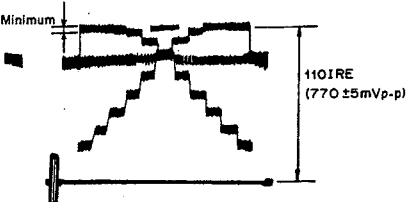
No.	Item	Measuring instrument & pattern	Test point	Adjustment part	Description
11.	BIAS-2 (G) adjustment	Oscilloscope [H-rate] 10:1  Gray scale pattern	● EXT TRIGGER TP-26 (ID), [PROCESS Board]  TP-33 [MATRIX Board]	R28 (G. BIAS) [MATRIX Board]	<div>■ Standard iris setting</div> <div>● While observing the waveform at TP-21, adjust the iris control knob (lens side) so that the CCD OUT waveform is <math>150 \pm 1 \text{mVob-w}</math>.</div> <div>1. While observing the waveform at TP-33, raise and lower the waveform by R28 (G. BIAS) to adjust so that the waveform comes to the center between the upper and lower limit positions as shown in Fig. 11-1.</div> <div></div> <div></div> <div>Fig. 11-1</div>
12.	G. GAIN adjustment	Oscilloscope [V-rate] 10:1  Gray scale pattern	● EXT TRIGGER pin ⑨ of Module C (SSG)  TP-35 [MATRIX Board]	R40 (G. GAIN) [MATRIX Board]	<div>■ Standard iris setting</div> <div>● While observing the waveform at TP-21, adjust the iris control knob (lens side) so that the CCD OUT waveform is <math>150 \pm 1 \text{mVob-w}</math>.</div> <div>1. While observing the waveform at TP-35, adjust R40 (G. GAIN) so that the waveform is linear as shown in Fig. 12-1.</div> <div></div> <div></div> <div></div> <div>Fig. 12-1</div>

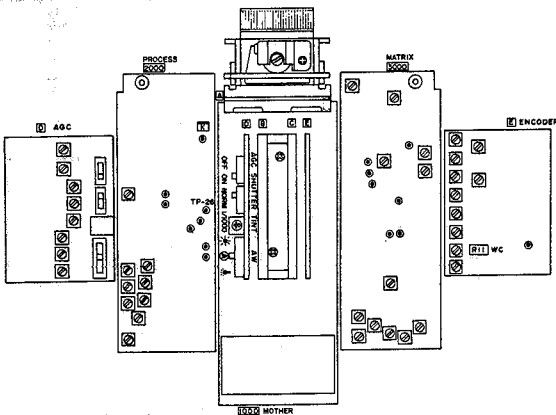


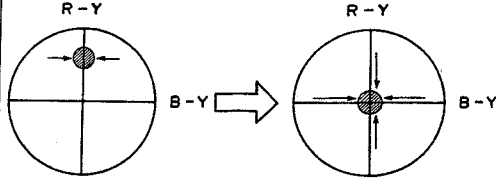
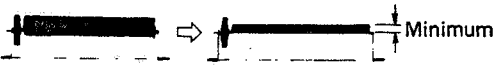
No.	Item	Measuring instrument & pattern	Test point	Adjustment part	Description
13.	MPX OFFSET adjustment	Vectorscope Oscilloscope (H-rate 10:1)	VIDEO OUT	R65 (R/B OFF SET1) R61 (R/B OFF SET2) [MATRIX Board]	<p>[When using the Vectorscope]</p> <ul style="list-style-type: none"> <li>● Close the iris with the lens cap.</li> <li>1. While observing the waveform at VIDEO OUT, adjust R65 (R/B OFFSET 1) and R61 (R/B OFFSET 2) so that the carrier is centered and minimized as shown in Fig. 13-1.</li> </ul>  <p>Fig. 13-1</p> <p>[When using the Oscilloscope]</p> <ul style="list-style-type: none"> <li>● Close the iris with the lens cap.</li> <li>1. While observing the waveform at VIDEO OUT, adjust R65 (R/B OFFSET 1) and R61 (R/B OFFSET 2) so that the carrier is minimized as shown in Fig. 13-2.</li> </ul>  <p>Fig. 13-2</p>

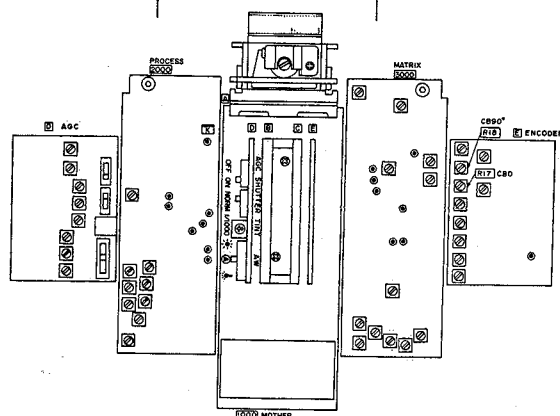
No.	Item	Measuring instrument & pattern	Test point	Adjustment part	Description
14.	R/B <sub>1</sub> GAIN adjustment	<div>Vectorscope</div> <div>Oscilloscope</div> <div>(H-rate 10:1)</div> <div>Color bar pattern</div>	<div>VIDEO OUT</div> <div>● EXT TRIGGER</div> <div>TP-26 (ID),</div> <div>[PROCESS Board]</div>	<div>R25</div> <div>(R/B<sub>1</sub> GAIN)</div> <div>[MATRIX Board]</div>	<div>[When using the Vectorscope]</div> <div>● Take the color bar pattern and set the carrier to the R ⊕ position by the iris control knob.</div> <div>1. While observing the waveform at VIDEO OUT, adjust R25 (R/B<sub>1</sub> GAIN) with separate carrier balls so that each pair of carrier balls are unified to one as shown in Fig. 14-1.</div> <div></div> <div>Fig. 14-1</div> <div>[When using the Oscilloscope]</div> <div>● Take the color bar pattern and set the white signal to 700mV by the iris control knob.</div> <div>1. While observing the waveform at VIDEO OUT, adjust R25 (R/B<sub>1</sub> GAIN) so that the waveform swing is minimized.</div>

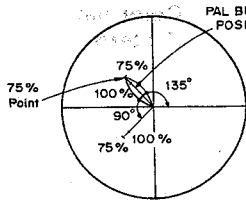
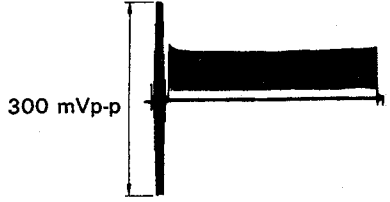
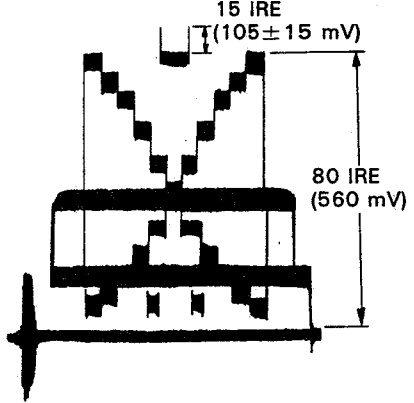
No.	Item	Measuring instrument & pattern	Test point	Adjustment part	Description
15.	SYNC LEVEL adjustment	Oscilloscope (H-rate) [10:1]	VIDEO OUT	R10 (SYNC) [ENCODER Board]	<ul style="list-style-type: none"> <li>● Close the iris with the lens cap.</li> <li>1. While observing the waveform at VIDEO OUT, adjust R10 (SYNC) so that the sync level is <math>300 \pm 10 \text{ mV}</math> as shown in Fig. 15-1.</li> </ul>  <p>Fig. 15-1</p>
16.	Y SETUP 1 adjustment	Oscilloscope (H-rate) [10:1]	VIDEO OUT	R12 (PED) [ENCODER Board]	<ul style="list-style-type: none"> <li>● Close the iris with the lens cap.</li> <li>1. While observing the waveform at VIDEO OUT, adjust R12 (PED) so that the setup level is <math>50 \pm 3 \text{ mV}</math> as shown in Fig. 16-1.</li> </ul>  <p>Fig. 16-1</p>
17.	Y GAIN adjustment	Oscilloscope (H-rate) [10:1]  Gray scale pattern	<ul style="list-style-type: none"> <li>● EXT TRIGGER TP-26 (ID), [PROCESS Board]</li> </ul> VIDEO OUT	R14 (YG) [ENCODER Board]	<ul style="list-style-type: none"> <li>■ Standard iris setting</li> <li>● While observing the waveform at TP-21, adjust the iris control knob (lens side) so that the CCD OUT waveform is <math>150 \pm 1 \text{ mVob-w}</math>.</li> <li>1. While observing the waveform at VIDEO OUT, adjust R14 (YG) so that the waveform is 100 IRE (700 mVo-p) as shown in Fig. 17-1.</li> </ul>  <p>Fig. 17-1</p>


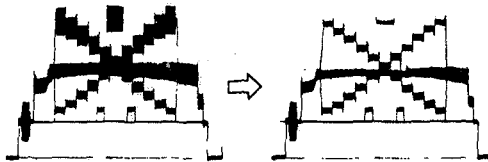
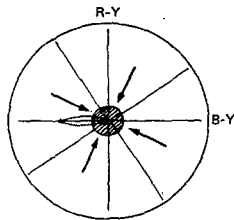
No.	Item	Measuring instrument & pattern	Test point	Adjustment part	Description
18.	WHITE CLIP adjustment	Oscilloscope (H-rate 10:1)  Gray scale Pattern	● EXT TRIGGER TP-26 (ID), [PROCESS Board]  VIDEO OUT	R11 (WC) [ENCODER Board]	<div>● Open the iris sufficiently.</div> <div>1. While observing the waveform at VIDEO OUT, adjust R11 (WC) so that the waveform is 110 IRE (<math>770 \pm 5 \text{mVp-p}</math>) as shown in Fig. 18-1.</div> <div></div> <div>Fig. 18-1</div>

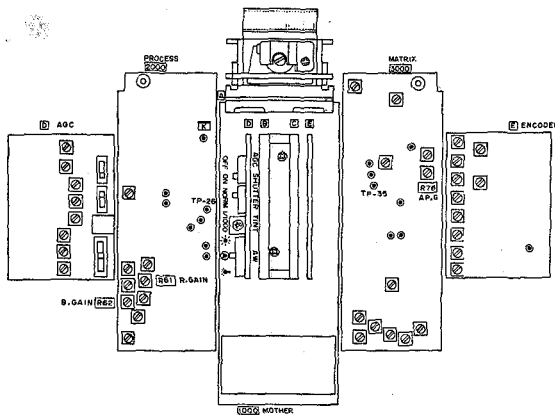


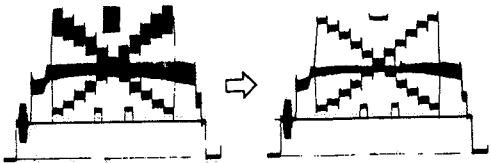
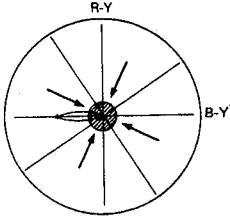
No.	Item	Measuring instrument & pattern	Test point	Adjustment part	Description
19.	CARRIER BALANCE adjustment	Vectorscope Oscilloscope [H-rate 10:1]  Color bar Pattern	VIDEO OUT	R17 (CB0) R18 (CB 90) [ENCODER Board]	<p>[When using the Vectorscope]</p> <ul style="list-style-type: none"> <li>● Close the iris with the lens cap.</li> <li>1. Set the carrier to on the R-Y axis by R17 (CB0) as shown in Fig. 19-1.</li> <li>2. Adjust R18 (CB90) so that the carrier comes to the intersecting point between the R-Y axis and the B-Y axis.</li> </ul>  <p>Fig.19-1</p> <p>[When using the Oscilloscope]</p> <ul style="list-style-type: none"> <li>● Close the iris with the lens cap.</li> <li>1. While observing the waveform at VIDEO OUT, adjust R17 (CB0) and R18 (CB90) so that the carrier is minimized as shown in Fig. 19-2.</li> </ul>  <p>Fig. 19-2</p>

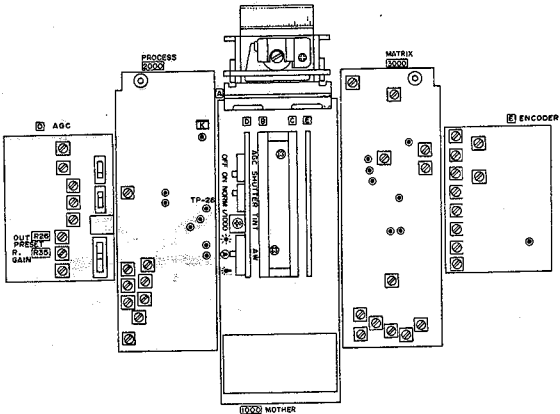


No.	Item	Measuring instrument & pattern	Test point	Adjustment part	Description
20.	HUE & BURST GAIN adjustment	Vectorscope	VIDEO OUT	R16 (BG) R15 (HUE) [ENCODER Board]	<p>● Close the iris by applying the lens cap.</p> <ol style="list-style-type: none"> <li>1. Adjust R15 (HUE) so that the BURST becomes PAL BURST POSITION.</li> <li>2. Adjust R16 (BG) so that the BURST LEVEL is set at the 75% shown in Fig. 20-1.</li> </ol>  <p>Fig. 20-1</p> <p><b>Notes</b></p> <ol style="list-style-type: none"> <li>1. The BURST POSITION adjustment can only be performed with a vectorscope.</li> <li>2. A rough adjustment of BURST GAIN is possible also with an oscilloscope.</li> </ol>  <p>Fig. 20-2</p>
21.	APACON LEVEL adjustment	Oscilloscope (H-rate 10:1)  Gray scale pattern	VIDEO OUT	R23 (APL) [ENCODER Board]	<p>● Set the VIDEO OUT level to 80 IRE (<math>560 \pm 15 \text{ mV}</math>) by the iris control knob (lens side).</p> <p><b>NOTE:</b> Focus the lens accurately. If the lens is out of focus, the overshoot wave does not appear clearly.</p> <ol style="list-style-type: none"> <li>1. Adjust R23 (APL) so that the overshoot quantity of the white peak at the gray scale center is 15 IRE (<math>105 \pm 15 \text{ mV}</math>) as shown in Fig. 21-1.</li> </ol>  <p>Fig. 21-1</p>

No.	Item	Measuring instrument & pattern	Test point	Adjustment part	Description
22.	V. CONTOUR adjustment	Oscilloscope [V-rate 10:1]  Gray scale pattern	● TP-35 [MATRIX Board]	R78 (AP.G) [MATRIX Board]	<ul style="list-style-type: none"> <li>● Set the VIDEO OUT level to 80 IRE (560 mV) by the iris control knob (lens side).</li> <li>● Let make the central section (white) of the gray scale close-up.</li> <li>● Focus the lens accurately.</li> <li>1. Adjust R78 (AP. G) so that the overshoot quantity of the white peak is <math>250 \pm 1 \text{ mVp-p}</math> as shown in Fig. 22-1.</li> </ul>  <p>Fig. 22-1</p>
23.	WHITE BALANCE adjustment 1 (INDOOR)	Oscilloscope [H-rate 10:1]  Vectorscope  Gray scale pattern	VIDEO OUT ● EXT TRIGGER TP-26 (ID), [PROCESS Board]	R61 (R.GAIN) R62 (B.GAIN) [PROCESS Board]	<p>[When using the Oscilloscope]</p> <ul style="list-style-type: none"> <li>● Set the VIDEO OUT level to 100 IRE (700 mV) by the iris control knob (lens side).</li> <li>1. Check that the white balance switch is set to "●" (INDOOR).</li> <li>2. Adjust R61 (R. GAIN) and R62 (B. GAIN) so that the carrier for the middle tone section of the gray scale is minimized as shown in Fig. 23-1.</li> </ul>  <p>Fig. 23-1</p> <p>[When using the Vectorscope]</p> <ul style="list-style-type: none"> <li>● Set the VIDEO OUT level to 100 IRE (700 mV) by the iris control knob (lens side).</li> <li>1. Check that the white balance switch is set to "●" (INDOOR).</li> <li>2. Adjust R61 (R. GAIN) and R62 (B. GAIN) so that the carrier is minimized and comes to the center of the vector-scope as shown in Fig. 23-2.</li> </ul>  <p>Fig. 23-2</p>



No.	Item	Measuring instrument & pattern	Test point	Adjustment part	Description
24.	WHITE BALANCE adjustment 2 (OUT-DOOR)	<p>Oscilloscope [H-rate 10:1]</p> <p>Color temperature conversion filter 80C+ CC10C+ CC10B</p> <p>Vectorscope</p> <p>Gray scale pattern</p>	<p>● EXT TRIGGER TP-26 (ID), [PROCESS Board]</p> <p>VIDEO OUT</p>	<p>R26 (OUT PRESET) R35 (R.GAIN) [AGC Board]</p>	<ul style="list-style-type: none"><li>● Set the VIDEO OUT level to 100 IRE (700 mV) by the iris control knob (lens side).</li><li>● Set the white balance switch to "☀" (OUTDOOR).</li><li>● Install the filter to the lens front.</li></ul> <p>[When using the Oscilloscope]</p> <p>1. Adjust R26 (OUT PRESET) and R35 (R. GAIN) so that the carrier for the middle tone section of the gray scale is minimized as shown in Fig. 24-1.</p> <p></p> <p>Fig. 24-1</p> <p>[When using the Vectorscope]</p> <p>1. Adjust R26 (OUT PRESET) and R35 (R. GAIN) so that the carrier is minimized and comes to the center of the vector-scope as shown in Fig. 24-2.</p> <p></p> <p>Fig. 24-2</p>





No.	Item	Measuring instrument & pattern	Test point	Adjustment part	Description
25.	WHITE BALANCE adjustment 3 (STOPPER 1)	DC voltmeter  Gray scale pattern Color temperature conversion filter  80C+CC10C+CC10B (OUTDOOR adjustment filter) C8, W10	● EXT TRIGGER TP-26 (ID), [Process Board]  Pin ⑭ of hinged connector <b>P</b>	R80(OUT-STOPPER) R81 (IN-STOPPER) [AGC Board]	<ul style="list-style-type: none"> <li>● Check that the white balance switch is set to "AUTO".</li> <li>1. Install the C8 filter and the OUTDOOR adjustment filter to the lens front.</li> <li>● Set the VIDEO OUT LEVEL TO 100 IRE (700 mV) by the iris control knob (lens side). (When it is less than 100 IRE, open the iris.)</li> <li>2. Measure the voltage at the <b>P</b> hinge connector pin ⑭ by the DC voltmeter to check that the voltage is less than 2.4 V. If the voltage is 2.4 V or more, adjust it to less than 2.4 V by R80 (OUT-STOPPER).</li> <li>3. Detach the C8 filter and the OUTDOOR adjustment filter, and install the W10 filter to the lens front.</li> <li>4. Measure the voltage at the <b>P</b> hinge connector pin ⑭ to check that the voltage is 2.8 V or more. If the voltage is less than 2.8 V, adjust it to 2.8 V or more by R81 (IN-STOPPER).</li> </ul>
26.	WHITE BALANCE adjustment 4 (AUTO)	DC voltmeter  Vectorscope  Oscilloscope (H-rate) 10:1  Color temperature conversion filter  80C+CC10C+CC10B (OUTDOOR adjustment filter)  Gray scale Pattern	● EXT TRIGGER TP-26 (ID), [PROCESS Board]  Pin ⑭ of hinged connector <b>P</b>  VIDEO OUT	R20 (AUTO ADJ) [AGC Board]	<ul style="list-style-type: none"> <li>● Check that the white balance switch is set to "AUTO".</li> <li>● Set the VIDEO OUT LEVEL TO 100 IRE (700 mV) by the iris control knob (lens side). (When it is less than 100 IRE, open the iris.)</li> <li>[When using the Vectorscope]</li> <li>1. Measure the voltage at the <b>P</b> hinged connector pin ⑭ and adjust R20 (AUTO ADJ) so that the voltage within <math>2.7 \pm 0.001</math> V and the carrier on the vectorscope is rounded.</li> <li>2. Pick up the gray scale and check that the auto white balance follows up under the indoor or outdoor illumination.</li> </ul>

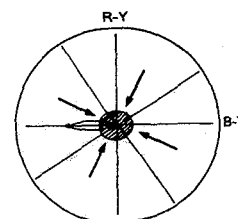
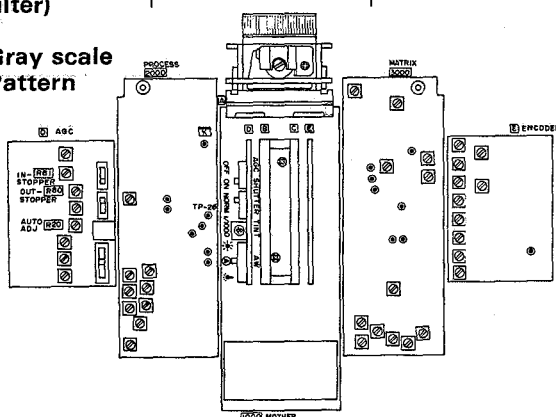


Fig. 26-1

[When using the Oscilloscope]

1. Measure the voltage at the **P** hinged connector pin ⑭ and adjust R20 (AUTO ADJ) so that the voltage is  $2.7 \pm 0.001$  V.
2. Pick up the gray scale and check that the auto white balance follows up under the indoor or outdoor illumination (by the Oscilloscope).

No.	Item	Measuring instrument & pattern	Test point	Adjustment part	Description
27.	WHITE BALANCE adjustment 5 (STOPPER 2)	DC voltmeter  Gray scale pattern  Color temperature conversion filter  80C+CC10C +CC10B (OUTDOOR adjustment filter)	● EXT TRIGGER TP-26 (ID) [PROCESS Board] Pin ⑭ of hinged connector <b>P</b>	R80 (OUT-STOPPER) R81 (IN-STOPPER) [AGC Board]	<ul style="list-style-type: none"><li>● Check to make sure the white balance switch is set to "☀" (OUTDOOR).</li><li>1. Mount the OUTDOOR adjustment filter to the lens front.</li><li>● Set the VIDEO OUT level to 100 IRE (700 mV).</li><li>2. Measure the voltage at the <b>P</b> hinged connector pin ⑭, and set it to (Vo) at that time.</li><li>● Check that the white balance switch is set to "AUTO".</li><li>3. Install the C8 filter and the OUTDOOR adjustment filter to the lens front.</li><li>● Set the VIDEO OUT level to 100 IRE (700 mV).</li><li>4. Measure the voltage at the <b>P</b> hinged connector pin ⑭ and adjust R80 (OUT-STOPPER) so that the voltage is <math>V_0 - 0.03 \pm 0.005</math> V.</li><li>5. Detach the C8 filter and the OUTDOOR adjustment filter, and install the W10 filter to the lens front.</li><li>6. Measure the voltage at the <b>P</b> hinged connector Pin ⑭ and adjust R81 (IN-STOPPER) so that the voltage is <math>2.74 \pm 0.005</math> V.</li></ul>
28.	G CLIP adjustment	Oscilloscope (H-rate 10:1) Gray scale pattern	● EXT TRIGGER TP-26 (ID) [PROCESS Board] VIDEO OUT	R11 (WC) [ENCODER Board] R26 (G. PEAK) [PROCESS Board]	<ul style="list-style-type: none"><li>● Open the iris sufficiently.</li><li>1. While observing the waveform at VIDEO OUT, adjust R11 (WC) so that the waveform is around 110 IRE (<math>770 \pm 5</math> mVp-p) as shown in Fig. 28-1.</li><li>2. Adjust R26 (G. PEAK) so that the carrier in the upper portion of the waveform is minimized as shown in Fig. 28-1.</li></ul>

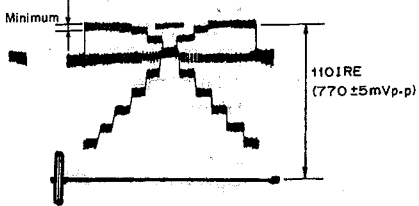
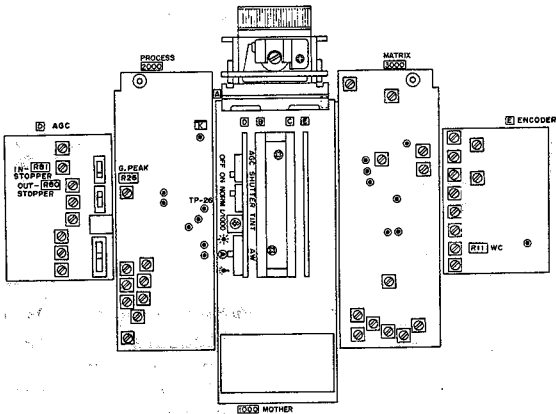
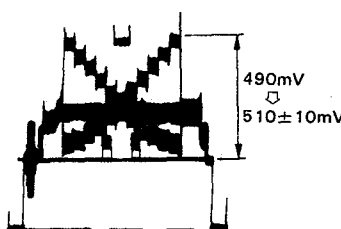
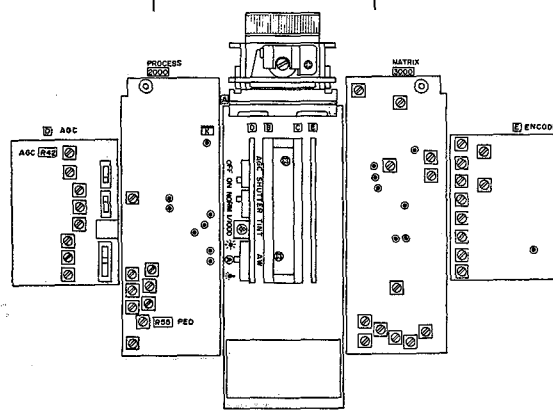
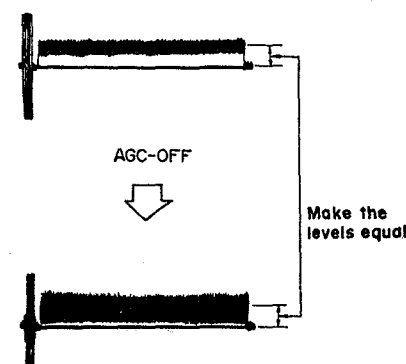
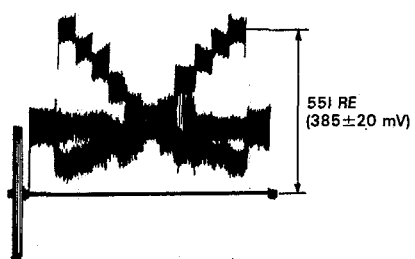
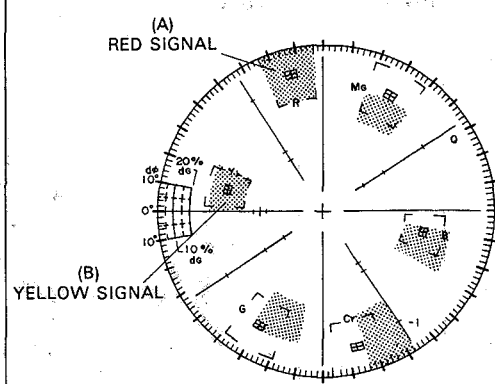
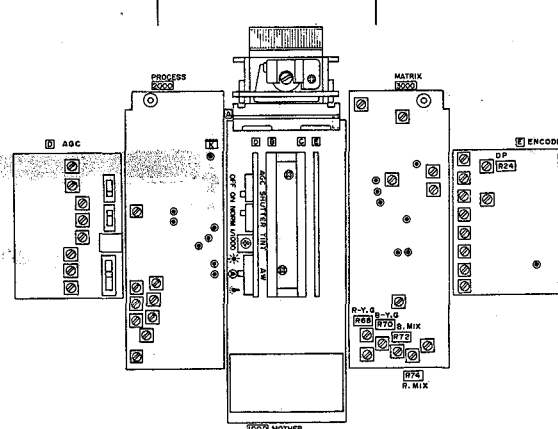
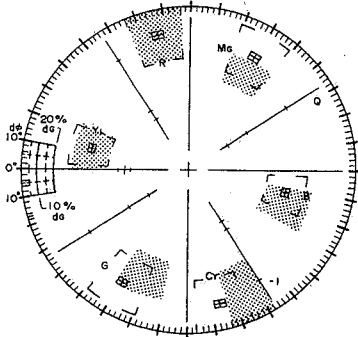


Fig. 28-1

No.	Item	Measuring instrument & pattern	Test point	Adjustment part	Description
29.	AGC START POINT adjustment	Oscilloscope [H-rate] 10:1  Gray scale Pattern	VIDEO OUT	R42 (AGC) [AGC Board]	<ul style="list-style-type: none"> <li>● Set the VIDEO OUT level to 70 IRE (490 mV) by the iris control knob (lens side).</li> <li>● Set the white balance switch to "●" (INDOOR).</li> <li>1. Set the AGC switch to ON.</li> <li>2. At this time, adjust R42 (AGC) so that the waveform is <math>510 \pm 10</math> mV as shown in Fig. 29-1.</li> </ul>  <p>Fig. 29-1</p> <p>NOTE: The operation speed is low. So, pay sufficient attention.</p> <li>3. After adjustment, set the AGC switch to "OFF".</li>
30.	Y. SETUP 2 adjustment	Oscilloscope [H-rate] 10:1	VIDEO OUT	R55 (PED) [PROCESS Board]	<ul style="list-style-type: none"> <li>● Close the iris with the lens cap.</li> <li>1. Adjust R55 (PED) so that the setup level does not vary due to the repeated ON/OFF operation of the AGC switch as shown in Fig. 30-1.</li> <li>2. After adjustment, check the Y. setup level. If deviated, repeatedly perform "16. Y. SETUP 1 adjustment" and this Y. SETUP 2 adjustment.</li> </ul>   <p>Fig. 30-1</p>

No.	Item	Measuring instrument & pattern	Test point	Adjustment part	Description
31.	AGC DEPENDENT adjustment	Oscilloscope [H-rate 10:1] Gray scale Pattern	VIDEO OUT	R24 (DP) [ENCODER Board]	<ul style="list-style-type: none"> <li>● Set the AGC switch to ON.</li> <li>● Set the illumination of the object to 10 lux.</li> <li>● Open the iris sufficiently.</li> </ul> <ol style="list-style-type: none"> <li>1. Adjust R24 (DP) so that the waveform level is 55 IRE (<math>385 \pm 20</math> mV) as shown in Fig. 31-1.</li> </ol>  <p>55 IRE (<math>385 \pm 20</math> mV)</p> <p>Fig. 31-1</p>
32.	COLOR REPRODUCTION adjustment	Vectorscope Color bar pattern (CC-2T)  Oscilloscope [H-rate 10:1] Monitor TV	VIDEO OUT	R72 (B.MIX) R74 (R. MIX) R68 (R-Y. G) R70 (B-Y. G) [MATRIX Board]	<ol style="list-style-type: none"> <li>1. Take the color bar pattern and set the white level to 700 mV by the iris control knob.</li> <li>2. Adjust R72 (B. MIX), R74 (R. MIX), R68 (R-Y G) and R70 (B-Y G) so that the red signal enters within frame (A) and the yellow signal enters within frame (B) as shown in Fig. 32-1.</li> </ol>  <p>(A) RED SIGNAL</p> <p>(B) YELLOW SIGNAL</p> <p>Fig. 32-1</p> <ol style="list-style-type: none"> <li>3. Set the AGC Switch to OFF.</li> </ol> <p><b>NOTE:</b> When no vectorscope is available, take the color bar pattern and optimize the color reproduction while seeing the monitor TV.</p> 

No.	Item	Measuring instrument & pattern	Test point	Adjustment part	Description
33.	<b>BACK FOCUS adjustment</b>	Monitor TV Siemens chart or resolution pattern. Siemens pattern or white/black stripe object	VIDEO OUT	Lock screw Focus screw	<ul style="list-style-type: none"> <li>This adjustment is also feasible without removing the cover.</li> <li><b>Open the iris in the darkish location.</b> <ol style="list-style-type: none"> <li>Place the siemens chart in a place more than 3 m away. (Place the siemens chart in a place as much away as possible.)</li> <li>Focus the lens to the chart in the TELE end. Next, engaging the WIDE mode slowly, check that the lens is just focused.</li> <li>If out of focus, loosen the lock screw and then adjust the focus screw to just focus.</li> <li>Repeatedly perform <b>steps 2 and 3</b> until it is optimally focused.</li> <li>Where an optimum back focus is obtained, tighten the lock screw.</li> </ol> </li> </ul>
34.	<b>FINAL CHECK</b>	Oscilloscope <b>(H-rate 10:1)</b>  Vectorscope  Gray scale pattern  Color bar pattern (CC-2T)  Colored object, etc.	VIDEO OUT   <b>Fig. 34-1</b>		<ol style="list-style-type: none"> <li>In the standard iris mode or auto iris mode (with the lens having an auto iris function), shoot the color bar pattern, and check that the carriers for individual colors on the vectorscope are located as shown in <b>Fig. 34-1</b>.</li> <li>Operate switches to check their respective proper operations.</li> <li>Shoot the gray scale pattern and check GAMMA, WHITE BALANCE, CARRIER BALANCE, Y. SETUP, etc. at VIDEO OUT.</li> <li>Shoot an appropriate color object and check the color reproduction, the camera function, etc.</li> <li>If the results of check are not satisfactory, perform the respective adjustment items again.</li> </ol>

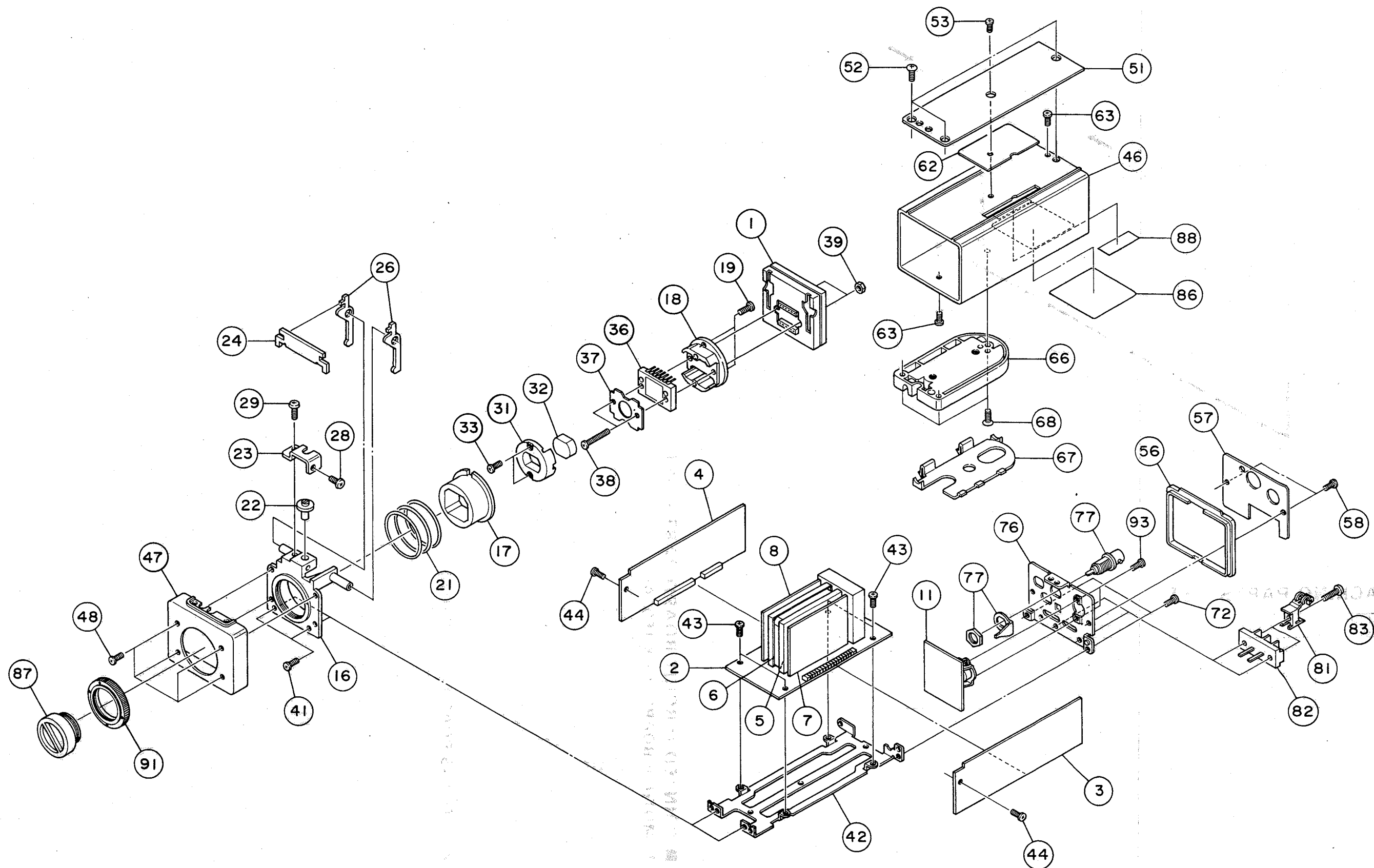
# 3. PARTS LIST

## ■ SYSTEM ASSEMBLY REPLACEMENT PARTS LIST

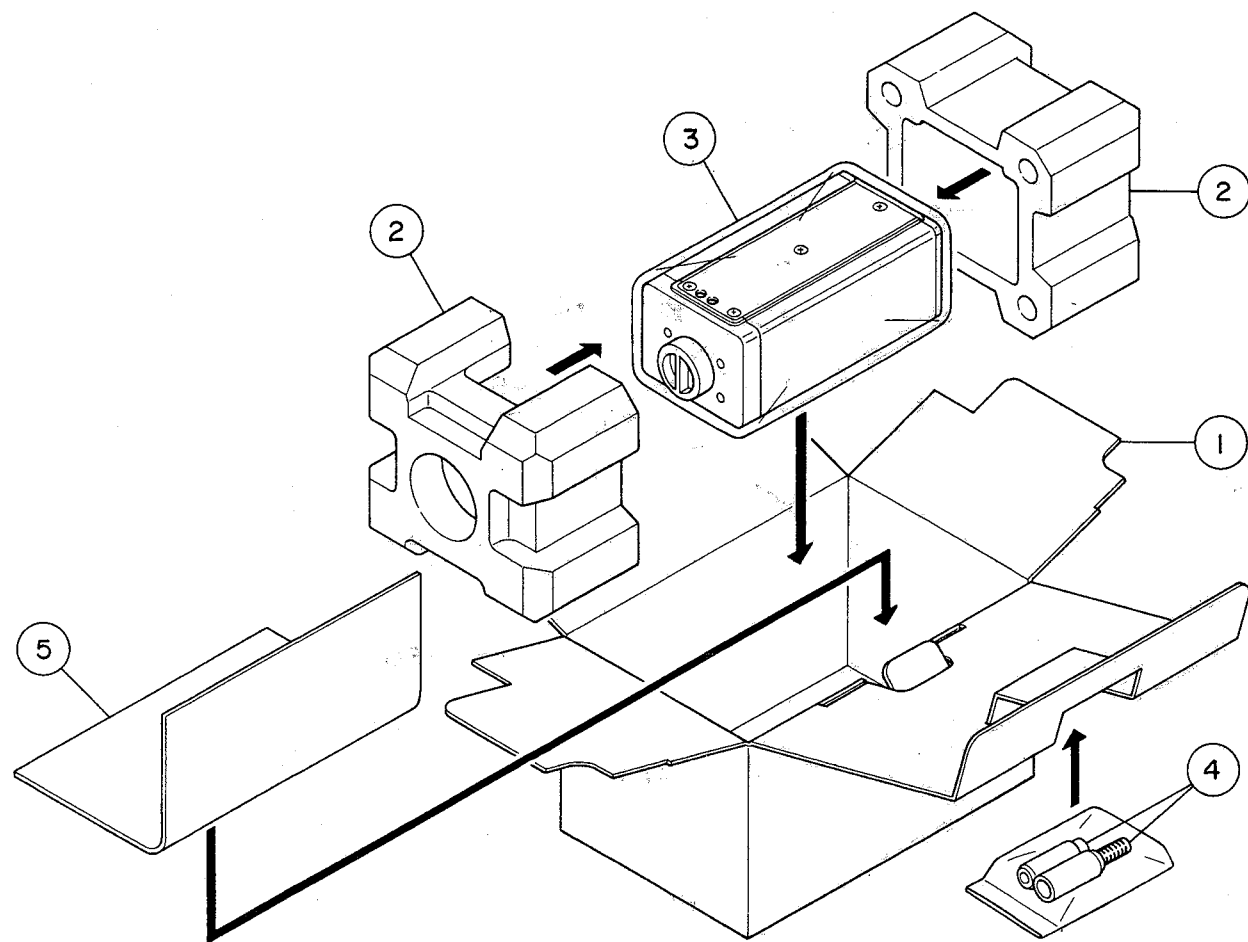
The module PC boards marked with © are supplied as assemblies.

SYMBOL NO.	PART NO.	PART NAME	REMARKS
△ 1	CAX-A001A	IMAGER MODULE	©
△ 2		MOTHER BOARD	CAX-1502A
△ 3		PROCESS BOARD	CAX-2501A
△ 4		MATRIX BOARD	CAX-3501A
△ 5	CAX-B501A	TG & V. DRV. MODULE	©
△ 6	CAX-C501A	SSG MODULE	©
△ 7	CAX-D001A	AGC & W/B MODULE	©
△ 8	CAX-E501A	ENCODER MODULE	©
△ 11		TERMINAL BOARD	CAX-9503A
16	CM21346-A01	CHASSIS MOUNT	
17	CM32653-A01	ADJUST RING	
18	CM32654-001	IMAGER HOLDER	
19	SPSK2040M	MINI SCREW	×2
21	CM44649-001	ADJUST SPRING	
22	CM44650-001	ECCENTRIC ROD	
23	CM44651-002	LOCK PLATE	
24	CM44652-001	PUSH BAR	
26	CM44653-001	ROCKING ARM	×2
28	SPSP2604Z	SCREW	
29	SPSX2608Z	PM SCREW	
31	CM32655-A01	LPF HOLDER	
32	CE41373-A0A	OP-LPF ASSY	
33	SPSK2040M	MINI SCREW	×2
36	ICX031AK	CCD IMAGER	
37	CM44654-001	IMAGER MASK	
38	CM44002-001	MINI SCREW	×2
39	NNS2000Z	NUT	×2
41	SPSK2040M	MINI SCREW	×2
42	CM21353-001	CHASSIS FRAME	
43	SPSH2040M	MINI SCREW	×4
44	SPSH2040M	MINI SCREW	×2
46	CM21375-B0D	AL CASE ASSY	
47	CM21349-001	FRONT DIECASTING	
48	SPSK2050M	MINI SCREW	×4
51	CM32672-005	TOP PLATE	
52	SHSP2606R	SCREW	×3
53	SDSP2603R	SCREW	
56	CM32664-A01	REAR MOLD FRAME	
57	CM32665-009	TERMINAL PALTE	
58	SPSK2040M	MINI SCREW	×2
62	CM44873-005	SW ADJ LABEL	
63	SPSK2040R	MINI SCREW	×2
66	CM21394-B0A-M0	TRIPOD BASE ASSY	
67	CM32754-B01-M0	TRIPOD COVER	
68	SHSP2606R	SCREW	×3
72	SPSH2040M	MINI SCREW	×2
76	CM21348-A01	TERMINAL BKT	
77	CEMB004-00A	BNC CONNECTOR	
81	CM32763-A01	CABLE CLIP	×2
82	CE41382-001	TERMINAL	
83	SPSP3010M	SCREW	×2
86	CM32667-019 (R)	R N LABEL	
87	CM40016-001	DUST COVER	
88	CM44485-A01-LA	LABEL	
91	CM44748-001	C MOUNT ADAPTOR	
93	SPSK2040M	MINI SCREW	×2

■ EXPLODED VIEW



# PACKING



# PACKING PARTS LIST

SYMBOL NO.	PART NO.	PART NAME	REMARKS
1	CP20228-053	PACKING CASE	
2	CP20369-00A	CUSHION ASSY	
3	CP30367-001	POLY BAG	
4	CE41155-001	IRIS PLUG	
5	TK-885E-1B-A	INST. BOOK	

# PRINTED CIRCUIT BOARD PARTS LIST 1. MOTHER BOARD (CAX-1502A)

SYMBOL NO.	PART NO.	PART NAME	REMARKS
DIODE			
D1001	MA3056 (L) -W	CHIP ZENER DIODE	
D1002	MA157-W	CHIP DIODE	
D1003	MA157-W	CHIP DIODE	
OTHERS			
	CE41450-B0A	SW REGULATOR	
	CM31655-001	SHIELD L	
	CM31655-001	SHIELD L	
	CM31655-A01	SHIELD FRAME	
	CM31655-001	SHIELD R	
	CM41801-001	MODULE INSULATOR X2	
	CM41801-001	MODULE INSULATOR X2	
	CM41800-B01	INSULATOR A	
	ICP-N5	IC PROTECTOR	
CPI001			


# 2. PROCESS BOARD (CAX-2501A)

SYMBOL NO.	PART NO.	PART NAME	REMARKS
VARIABLE R			
R2026	CEVP004-172WA	CH V R	4.7k G. PEAK
R2055	CEVP004-223VA	CH V R	22k G. PEAK
R2057	CEVP004-103WA	CH V R	10k G. CTRL
R2058	CEVP004-103WA	CH V R	10k G. KNEE
R2059	CEVP004-103WA	CH V R	10k G. CAM. 1
R2061	CEVP004-103WA	CH V R	10k G. R. GAIN
R2062	CEVP004-103WA	CH V R	10k G. R. GAIN
R2073	CEVP004-103WA	CH V R	10k G. CAM. 2
R2074	CEVP004-103WA	CH V R	10k G. CAM. 2
CAPACITOR			
C2001	QCF81CH-180VLS	CH C CAP.	180PF
C2002	QCF81CH-180VLS	CH C CAP.	180PF
C2003	QCF81CH-180VLS	CH C CAP.	180PF
C2004	QCF81CH-180VLS	CH C CAP.	180PF
C2005	QCF81CH-180VLS	CH C CAP.	180PF
C2006	NEE11CM-106RZ	CH TAN E CAP.	10PF
C2007	NEE11CM-106RZ	CH TAN E CAP.	10PF
C2008	NEE11CM-106RZ	CH TAN E CAP.	10PF
C2009	NEE11CM-106RZ	CH TAN E CAP.	10PF
C2010	NEE11CM-106RZ	CH TAN E CAP.	10PF
C2011	NEE11CM-106RZ	CH TAN E CAP.	10PF
C2012	NEE11CM-106RZ	CH TAN E CAP.	10PF
C2013	NEE11CM-106RZ	CH TAN E CAP.	10PF
C2014	QCF81CH-180VLS	CH C CAP.	180PF
C2015	QCF81CH-180VLS	CH C CAP.	180PF
C2016	QCF81CH-180VLS	CH C CAP.	180PF
C2017	NEE20CM-335RY	CH TAN E CAP.	33PF
C2018	QCF81EX-104YL	CH C CAP.	10PF
C2019	QCF81EX-104YL	CH C CAP.	10PF
C2020	QCF81EX-104YL	CH C CAP.	10PF
C2021	QCF81EX-104YL	CH C CAP.	10PF
C2022	QCF81EX-104YL	CH C CAP.	10PF
C2023	QCF81EX-104YL	CH C CAP.	10PF
C2024	QCF81EX-104YL	CH C CAP.	10PF
C2025	QCF81EX-104YL	CH C CAP.	10PF
C2026	QCF81EX-104YL	CH C CAP.	10PF
C2027	QCF81EX-104YL	CH C CAP.	10PF
C2028	QCF81EX-104YL	CH C CAP.	10PF
C2029	QCF81EX-104YL	CH C CAP.	10PF
C2030	QCF81EX-104YL	CH C CAP.	10PF
C2031	QCF81EX-104YL	CH C CAP.	10PF
C2032	QCF81EX-104YL	CH C CAP.	10PF
C2033	QCF81EX-104YL	CH C CAP.	10PF
C2034	QCF81EX-104YL	CH C CAP.	10PF
C2035	QCF81EX-104YL	CH C CAP.	10PF
C2036	QCF81EX-104YL	CH C CAP.	10PF

SYMBOL NO.	PART NO.	PART NAME	REMARKS
CAPACITOR			
C2037	NEE21CM-105RY	CH TAN E CAP.	1PF
C2038	NEA10JM-226RZ	CH AL E CAP.	22PF
C2039	NEA10JM-226RZ	CH AL E CAP.	22PF
C2040	NEE21CM-105RY	CH TAN E CAP.	1PF
C2041	NEE21CM-105RY	CH TAN E CAP.	1PF
C2042	NEE21CM-105RY	CH TAN E CAP.	1PF
C2043	NEE21CM-105RY	CH TAN E CAP.	1PF
C2044	NEE21CM-105RY	CH TAN E CAP.	1PF
C2045	QEE41AK-107M	TAN. CAP.	100PF
C2046	QCF81HZ-473YLS	CH C CAP.	0.047PF
C2047	QCF81HZ-473YLS	CH C CAP.	0.047PF
C2048	NEA11CM-106RZ	CH AL E CAP.	10PF
C2049	NEE21CM-105RY	CH TAN E CAP.	1PF
C2050	QCF81HZ-473YLS	CH C CAP.	0.047PF
TRANSFORMER			
T2001	CE41121-A0AY	REFLOW TRANSF.	
COIL			
L2001	CE40344-100YL	CHIP INDUCTOR	10PH
DIODE			
D2001	MA151K-W	CHIP DIODE	
D2002	MA151K-W	CHIP DIODE	
D2003	MA151K-W	CHIP DIODE	
TRANSISTOR			
Q2001	2SK94-W	CHIP F E T	
Q2002	2SK94-W	CHIP F E T	
Q2003	2SK94-W	CHIP F E T	
Q2004	2SC2778 (B, C) -W	SI. TRANSISTOR	
Q2005	2SC2778 (B, C) -W	SI. TRANSISTOR	
Q2006	2SC2778 (B, C) -W	SI. TRANSISTOR	
Q2007	2SC2778 (B, C) -W	SI. TRANSISTOR	
Q2008	2SC2778 (B, C) -W	SI. TRANSISTOR	
Q2009	2SC2778 (B, C) -W	SI. TRANSISTOR	
Q2010	2SC2778 (B, C) -W	SI. TRANSISTOR	
Q2011	2SC2778 (B, C) -W	SI. TRANSISTOR	
Q2012	FW21-W	CHIP PAIR TR	
Q2013	2SC2778 (B, C) -W	SI. TRANSISTOR	
Q2014	2SC2778 (B, C) -W	SI. TRANSISTOR	
Q2015	2SC2778 (B, C) -W	SI. TRANSISTOR	
Q2016	FW1-W	CHIP PAIR TR	
Q2017	2SB709 (P-R) -W	CHIP TRANSISTOR	
IC			
IC2001	CX20053-B	I. C.	
IC2002	CX41157M	I. C.	
IC2003	UPC358C-W	I. C.	



## CAUTION

- The parts marked  are very important for the safety. When replacing these parts, be sure to use specified ones to secure the safety and performance.
- The parts which do not have the drawing in this Parts List, P.C. Board Ass'y and the Part No. columns of which are filled with lines —, will not be supplied.
- As a rule, the resistors and capacitors which are indicated as shown in (NOTE 2) "HOW TO EXPRESS PARTS NUMBERS OF STANDARD PARTS" are not shown in the list of the parts on the board.  
When ordering the service parts, confirm the resistance/rated power, capacitance/rated voltage, and type of the parts, then order by the part No. indicated according to (NOTE 2).

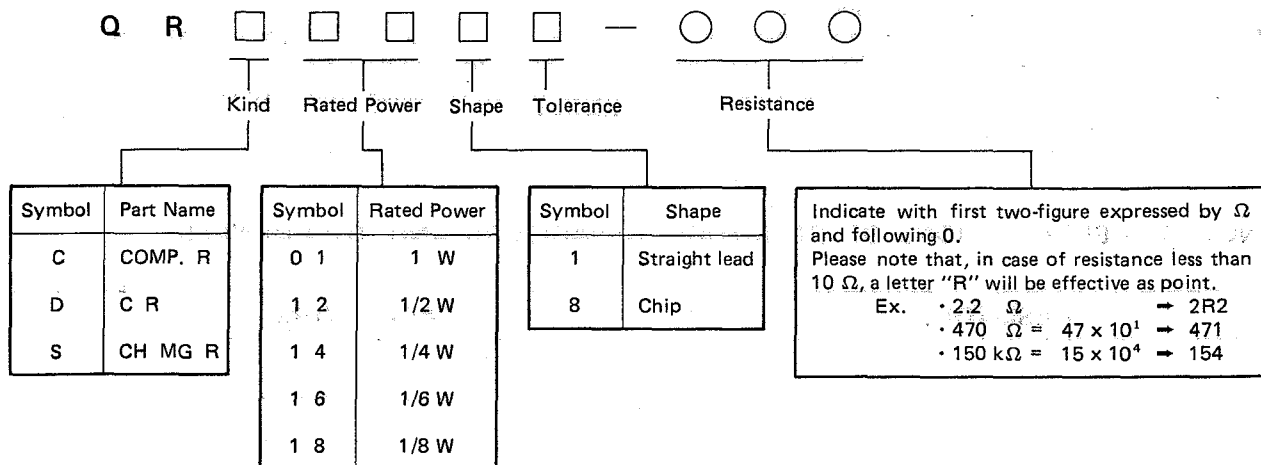
### (NOTE 1) ABBREVIATIONS OF RESISTORS, CAPACITORS AND TOLERANCES

RESISTORS		CAPACITORS	
C R	Carbon Resistor	C CAP.	Ceramic Capacitor
F R	Fusible Resistor	E CAP.	Electrolytic Capacitor
P R	Plate Resistor	M CAP.	Mylar Capacitor
V R	Variable Resistor	HV CAP.	High Voltage Capacitor
HV R	High Voltage Resistor	MF CAP.	Metalized Film Capacitor
MF R	Metal Film Resistor	MM CAP.	Metalized Mylar Capacitor
MG R	Metal Glazed Resistor	MP CAP.	Metalized Polystyrol Capacitor
MP R	Metal Plate Resistor	PP CAP.	Polypropylene Capacitor
OM R	Metal Oxide Film Resistor	PS CAP.	Polystyrol Capacitor
CMF R	Coating Metal Film Resistor	TF CAP.	Thin Film Capacitor
UNF R	Non-Flammable Resistor	MPP CAP.	Metalized Polypropylene Capacitor
CH V R	Chip Variable Resistor	TAN. CAP.	Tantalum Capacitor
CH MG R	Chip Metal Glazed Resistor	CH C CAP.	Chip Ceramic Capacitor
COMP. R	Composition Resistor	BP E CAP.	Bi-Polar Electrolytic Capacitor
LPTC R	Linear Positive Temperature Coefficient Resistor	CH AL E CAP.	Chip Aluminum Electrolytic Capacitor
		CH AL BP CAP.	Chip Aluminum Bi-Polar Capacitor
		CH TAN. E CAP.	Chip Tantalum Electrolytic Capacitor
		CH AL BP E CAP.	Chip Aluminum Bi-Polar Electrolytic Capacitor

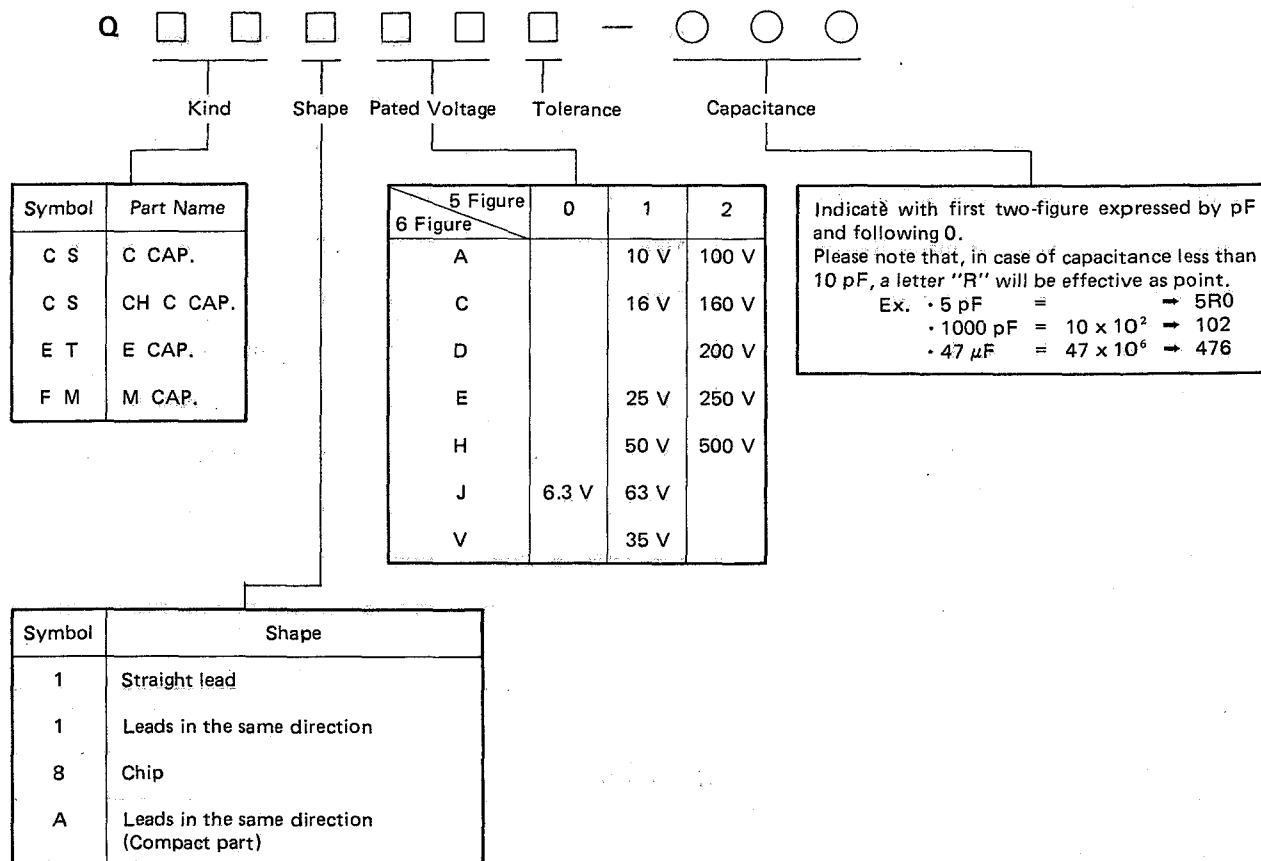
TOLERANCES									
F	G	J	K	M	N	R	H	Z	P
± 1 %	± 2 %	± 5 %	± 10 %	± 20 %	± 30 %	+ 30 % - 10 %	+ 50 % - 10 %	+ 80 % - 20 %	+ 100 % - 0 %

## NOTE 2 HOW TO EXPRESS PARTS NUMBERS OF STANDARD PARTS

### ■ RESISTOR



### ■ CAPACITOR



## 3. MATRIX BOARD (CAX-3501A)

SYMBOL NO.	PART NO.	PART NAME	REMARKS
VARIABLE R			
R3009	CEVP004-102WA	CH V R	1KΩ R/B0 GAIN
R3013	CEVP004-103WA	CH V R	10KΩ R/B1 BIAS
R3025	CEVP004-102WA	CH V R	1KΩ R/B1 GAIN
R3028	CEVP004-103WA	CH V R	10KΩ G, BIAS
R3040	CEVP004-102WA	CH V R	1KΩ G, GAIN
R3061	CEVP004-103WA	CH V R	10KΩ R/B OFF SET. 2
R3065	CEVP004-472WA	CH V R	4.7KΩ R/B OFF SET. 1
R3088	CEVP004-103WA	CH V R	22KΩ R-Y, G
R3070	CEVP004-223WA	CH V R	22KΩ B-Y, G
R3012	CEVP004-223WA	CH V R	22KΩ B MIX
R3074	CEVP004-223WA	CH V R	22KΩ R MIX
R3078	CEVP004-103WA	CH V R	10KΩ A.P. G
CAPACITOR			
C3001	NEE11AM-475RZ	CH TAN E CAP.	0.47μF 10V M
C3002	QCF81HZ-473YL	CH C CAP.	0.047μF 50V Z
C3003	NEE20GM-106RY	CH TAN E CAP.	10μF 4V M
C3004	NEE20GM-106RY	CH TAN E CAP.	10μF 4V M
C3005	QCF81HZ-473YL	CH C CAP.	0.047μF 50V Z
C3007	NEE11CM-106RZ	CH TAN E CAP.	10μF 16V M
C3008	QCF81HZ-473YL	CH C CAP.	0.047μF 50V Z
C3009	NEE10JM-106RZ	CH AL BP E CAP.	10μF 6.3V M
C3010	QCF81HZ-473YLS	CH C CAP.	0.047μF 50V Z
C3011	QCF81HZ-473YLS	CH C CAP.	0.047μF 50V Z
C3012	QCF81HZ-473YLS	CH C CAP.	0.047μF 50V Z
C3014	QCF81CH-104YLS	CH C CAP.	0.1μF 25V J
C3017	NEE20GM-106RY	CH TAN E CAP.	10μF 4V M
C3018	NEE20GM-106RY	CH TAN E CAP.	10μF 4V M
C3019	NEE10JM-106RZ	CH AL BP E CAP.	10μF 6.3V M
C3020	QCF81HZ-473YLS	CH C CAP.	0.047μF 50V Z
C3021	QCF81HZ-473YLS	CH C CAP.	0.047μF 50V Z
C3022	QCF81HZ-473YLS	CH C CAP.	0.047μF 50V Z
C3024	QCT81CH-101YLS	CH C CAP.	100pF 50V J
C3027	NEE20GM-106RY	CH TAN E CAP.	10μF 4V M
C3028	NEE20GM-106RY	CH TAN E CAP.	10μF 4V M
C3029	NEE10JM-685RZ	CH TAN E CAP.	6.8μF 3V M
C3030	NEE11AM-475RZ	CH TAN E CAP.	4.7μF 10V M
C3031	QCF81HZ-473YL	CH C CAP.	0.047μF 50V Z
C3032	QCF81CH-680YLS	CH C CAP.	68pF 50V J
C3033	QCY81EK-104YL	CH C CAP.	0.1μF 25V K
C3034	QCT81CH-580YLS	CH C CAP.	58pF 50V J
C3035	QCY81EK-104YLS	CH C CAP.	0.1μF 25V J
C3036	QCY81EK-104YL	CH C CAP.	0.1μF 25V K
C3037	QCY81EK-104YL	CH C CAP.	0.1μF 25V K
C3038	QCY81EK-104YL	CH C CAP.	0.1μF 25V K
C3039	NEE11AM-475RZ	CH TAN E CAP.	4.7μF 10V M
C3040	QCF81HZ-473YL	CH C CAP.	0.047μF 50V Z
C3041	QCY81EK-104YL	CH C CAP.	0.1μF 25V K
C3042	QCY81EK-104YL	CH C CAP.	0.1μF 25V K
C3043	QCF81HZ-473YLS	CH C CAP.	0.047μF 50V Z
C3044	QCF81HZ-473YLS	CH C CAP.	0.047μF 50V Z
C3045	QCT81CH-380YLS	CH C CAP.	38pF 50V J
C3046	QCT81CH-470YLS	CH C CAP.	47pF 50V J
C3047	QEB41CK-225M	TAN. CAP.	2.2μF 10V K
TRANSFORMER			
T3001	CE41120-00AY	REFLOW TRANSF.	
T3002	CE41120-00AY	REFLOW TRANSF.	
T3003	CE41089-00AY	REFLOW TRANSF.	

## 4. TERMINAL BOARD (CAX-9503A)

SYMBOL NO.	PART NO.	PART NAME	REMARKS
DIODE			
D3001	MA151WA-W	CHIP DIODE	
D3002	MA151WA-W	CHIP DIODE	
D3003	MA151WA-W	CHIP DIODE	
D3004	MA151A-W	CHIP DIODE	
TRANSISTOR			
Q3001	2SE709 (Q, R) -W	CHIP TRANSISTOR	
Q3002	2SE709 (Q, R) -W	CHIP TRANSISTOR	
Q3003	2SE709 (Q, R) -W	CHIP TRANSISTOR	
Q3004	2SE709 (Q, R) -W	CHIP TRANSISTOR	
Q3005	2SC2778 (B, C) -W	CHIP TRANSISTOR	
Q3006	2SE709 (Q, R) -W	CHIP TRANSISTOR	
Q3007	2SE709 (Q, R) -W	CHIP TRANSISTOR	
Q3008	2SC2778 (B, C) -W	CHIP TRANSISTOR	
Q3009	2SC2778 (B, C) -W	CHIP TRANSISTOR	
Q3010	2SE709 (Q, R) -W	CHIP TRANSISTOR	
Q3011	2SE709 (Q, R) -W	CHIP TRANSISTOR	
Q3012	2SC2778 (B, C) -W	CHIP TRANSISTOR	
Q3013	2SC2778 (B, C) -W	CHIP TRANSISTOR	
Q3014	2SC2778 (B, C) -W	CHIP TRANSISTOR	
Q3015	2SE709 (Q, R) -W	CHIP TRANSISTOR	
Q3016	2SE709 (Q, R) -W	CHIP TRANSISTOR	
Q3017	2SC2778 (B, C) -W	CHIP TRANSISTOR	
Q3018	2SC2778 (B, C) -W	CHIP TRANSISTOR	
IC			
IC30001	IR3P489	I. C. (M)	
IC3002	MN3028S-W	I. C. (M)	
IC3003	MN3028S-W	I. C. (M)	
CAPACITOR			
C9001	QEK40JM-227M	E CAP.	220μF 6.3V M
C9006	QEK40JM-227M	E CAP.	220μF 8.3V M
DIODE			
D9001	GL-3PR2	L. E. D.	
D9002	W06A	SI. DIODE	
OTHERS			
	CM44325-207	FUSE LABEL	
	CM44325-207	MINI CONNECTOR	
	CM44325-207	FUSE HOLDER	x2
	CM44325-207	LEAD SPACER	
	CM44325-207	SOCKET HOLDER	
	QMF51E2-1R0S	FUSE	1A

The following module PC boards are supplied as assemblies.  
The component parts only the module PC boards are available only  
when the parts are listed in the "MODULE PRINTED CIRCUIT  
BOARD PARTS LIST".

SYMBOL NO.	PART NO.	PART NAME	REMARKS
VARIABLE R			
RA011	CEVP003-103WA	CH V R	1000 O. P. D.
OTHERS	CE41372-001	CCD SOCKET	

SYMBOL NO.	PART NO.	PART NAME	REMARKS
VARIABLE R			
RD020	CEVP004-223WA	CH V R	22K AUTO ADJ.
RD025	CEVP004-472WA	CH V R	47K IN-FRE
RD026	CEVP004-472WA	CH V R	4.7K OUT-PRESET
RD027	QSR011-222K	V <sub>R</sub>	22K INT.
RD032	CEVP004-222WA	CH V R	2.2K R. OFF SET
RD035	CEVP004-223WA	CH V R	22K R. GAIN
RD042	CEVP004-472WA	CH V R	4.7K A. G. C.
RD080	CEVP004-102WA	CH V R R	1K OUT-STOPPER
RD081	CEVP004-102WA	CH V R	1K IN-STOPPER
OTHERS			
SW0001	QSR4B33-C003	SLIDE SWITCH	AW
SW0002	QSR4A12-C005	SLIDE SWITCH	ACC
SW0003	QSR4A12-C005	SLIDE SWITCH	SHUTTER

SYMBOL NO.	PART NO.	PART NAME	REMARKS
CAPACITOR CB037	QAT3661-300M	TRIM CAP.	

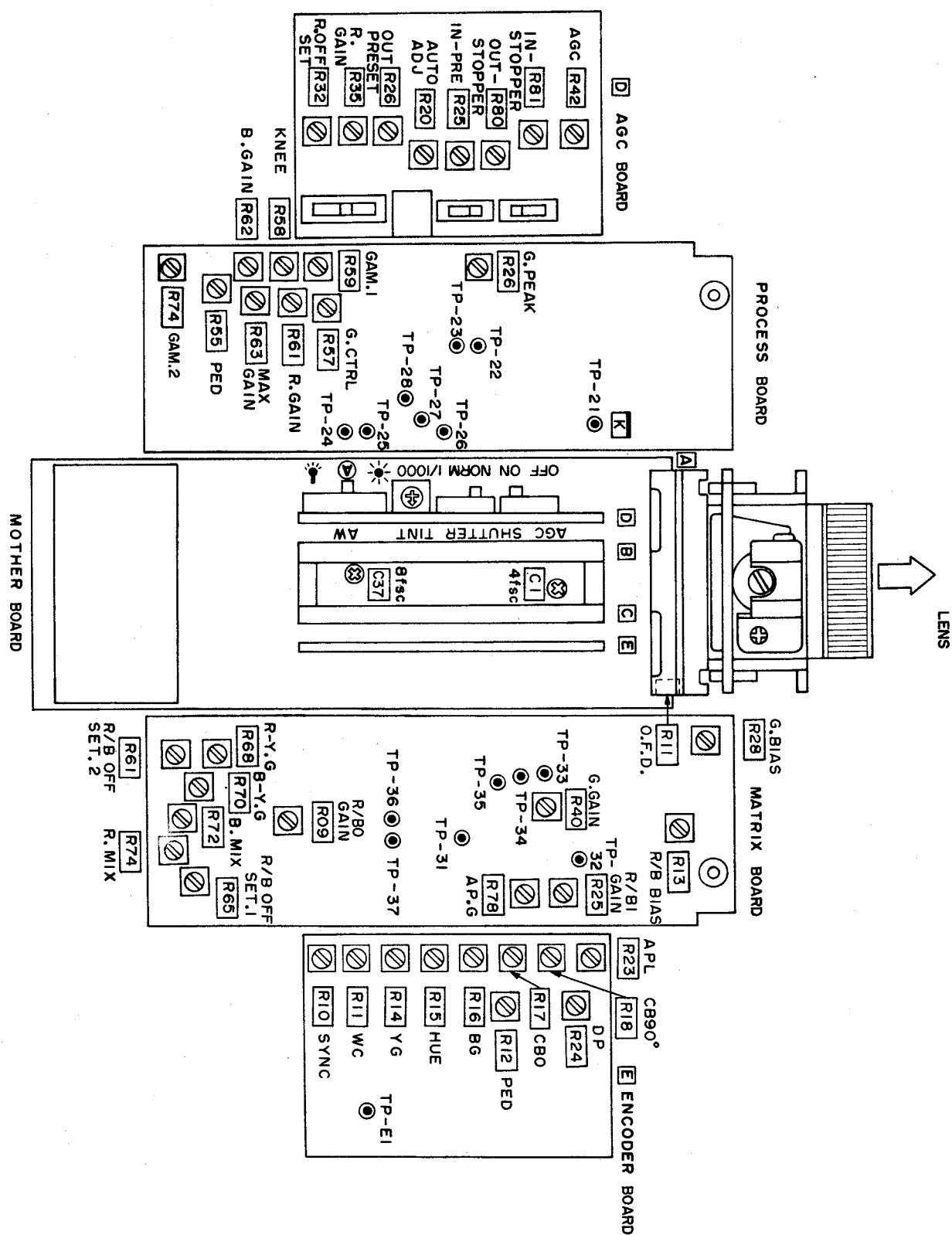
SYMBOL NO.	PART NO.	PART NAME	REMARKS
VARIABLE R			
RE010	CEVP003-103WA	CH V R	10K SYNC
RE011	CEVP003-103WA	CH V R	10K WC
RE012	CEVP003-103WA	CH V R	10K YC
RE013	CEVP003-103WA	CH V R	10K YD
RE014	CEVP003-103WA	CH V R	10K YG
RE015	CEVP003-103WA	CH V R	10K HUE
RE016	CEVP003-103WA	CH V R	10K BG
RE017	CEVP003-103WA	CH V R	10K CBQ
RE018	CEVP003-103WA	CH V R	10K CS90
RE023	CEVP003-473WA	CH V R	47K APL
RE024	CEVP003-473WA	CH V R	47K DP

SYMBOL NO.	PART NO.	PART NAME	REMARKS
CAPACITOR			
CC001	QAT3661-300M	TRIM CAP.	30pP
CC002	QAT3111-300MZ	TRIM CAP.	20pP

## [APPENDIX]

## ■ ADJUSTMENT VR LOCATION

- Please refer to this APPENDIX usefully when the adjustment, etc.



Chassis V54

# TK-885E

## STANDARD CIRCUIT DIAGRAM

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## 1. NOTES ON USING CIRCUIT DIAGRAMS

- Since the circuit diagram is a standard one, the circuit and circuit constants may be subject to change for improvement without any notice.
- Replacing the shaded (■) parts in the circuit diagram, be sure to use parts specified for safety purposes.
- The voltage values and waveforms have been measured under the following conditions:
  - Illumination : Illumination condition during standard adjustment
  - Object : JVC Gray scale pattern ( $\gamma = 2.2$ , 11 steps)
  - Iris : Set the VIDEO OUT waveform level to 700 mV<sub>PP</sub>-WP (AGC OFF) with IRIS switch (at the lens side)
  - White balance : Standard setting position (indoor)
  - Voltage values : ALL DC voltage values.  
Measured by a high-precision tester or a digital voltmeter.  
\*Note: Values inside ( \* ) are measured during genlock (with the black burst signal).
  - Waveform : Oscilloscope sweep time  
H: 20  $\mu$ S/div. V: 5 mS/div.  
Others: Measured time is shown  
Usually a probe of 10:1 is used.  
(Indicated when a 1:1 probe is used.)

\*Note: See also the information given in the circuit diagram.

- When entering the symbol numbers of parts on the Service Delivery Invoice, write as follows:  
[Example]  
In the PC board: CAX-1001A (R125  $\rightarrow$  R1125.  
C512  $\rightarrow$  C1512)

### 5. Indications on the circuit diagram.

- Resistors
  - 10K: resistance value  
non-unit: [ $\Omega$ ]
  - K: [K $\Omega$ ]
  - M: [M $\Omega$ ]
  - 1/2W: rated allowable power [W]
  - non-indication: 1/4 chip resistor or carbon resistor

- Electrolytic Capacitors  
47/16: capacitance value [ $\mu$ F]/working voltage [V]  
NP/BP: non-polar/bipolar electrolytic capacitor (T) or  
TAN.: Tantalum capacitor

- Capacitors  
0.033: capacitance value  
1 or higher: [pF], less than 1 : [ $\mu$ F]  
100V: working voltage  
All DC voltage except for AC indicated.  
non-indication: 50V DC  
MY: Mylar capacitor  
PP: Polypropylene capacitor  
non-indication: Ceramic capacitor

- Coils  
39: inductance value  
non-unit: [ $\mu$ H]

- Connections  
□□: connector  
 $\Delta$  or  $\rightarrow$  : chip connector  
○: soldering  
\* Refer to the parts list in the Service manual about the detailed indications of parts.



- The non-indicated chip transistor and chip diode on the Circuit Diagrams are as follows.

- PNP type : 2SB709 (Q, R)
- NPN type : 2SC2778 (C, D)
- Diode : MA151WA

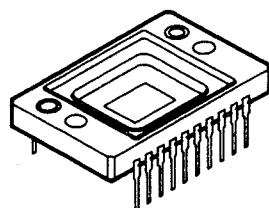
Interchangeable parts	Supplied parts
2SB709, 709 (P-R), 709 (Q-R)	2SB709 (Q, R)
2SC2778, 2778 (B, C) 2778 (C, D)	2SC2778 (C, D)
2SD601, 601 (Q, R)	2SD601 (Q, R)
2SD601A, 601A (Q, R)	2SD601 (Q, R)

- It is possible that the wiring diagram is inconsistent with the actual connection because of certain design improvements, etc. The diagram, therefore, should be used only for reference.

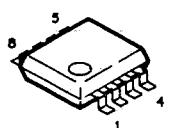
### 8. Color of P.C. Board. pattern.

-  Blue color shows top side pattern of P.C. Board.
-  Gray color shows bottom side pattern of P.C. Board.

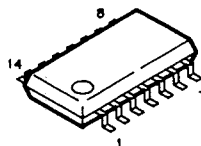
## 2. PIN ARRANGEMENTS OF IC's TRANSISTORS AND DIODES



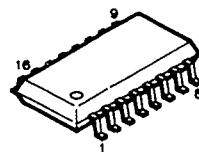
ICX031AX (20pin)



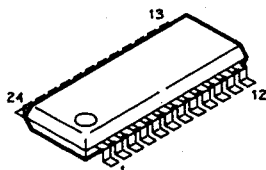
CXB0026AM (8pin)  
MNH0026M (8pin)  
MN8029S (8pin)  
μPC358G (8pin)



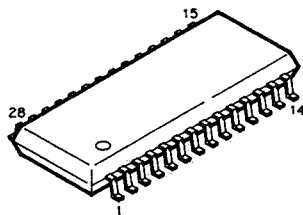
μPC4741G (14pin)  
μPD74HC74G (14pin)



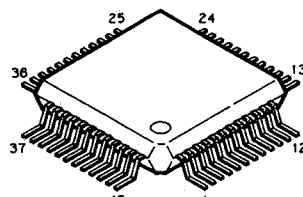
CAX1157M (16pin)



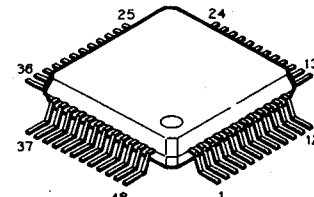
CX20180 (24pin)



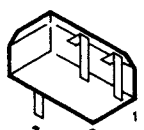
CX-7930A (28pin)



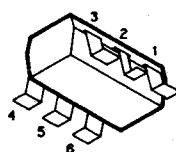
CX20053 (48pin)  
CX20055 (48pin)  
IR3P48 (48pin)



CXD11570

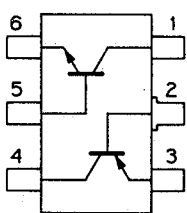


(C) (B) (E)  
(G) (S) (D)

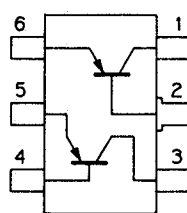


### CHIP TRANSISTOR

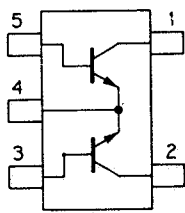
2SA1022 (B, C)  
2SA1022 (C)  
2SB709 (P-R)  
2SC2295 (C)  
2SC2404 (D)  
2SC2778 (B, C)  
2SD601 (Q, R)



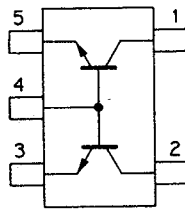
XN4601



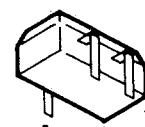
XN6401



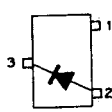
FMW1



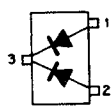
FMW2



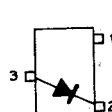
### CHIP DIODE



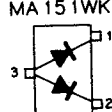
MA151K



MA157



MA151WK

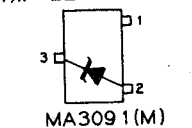


MA151A



MA151WA

### CHIP ZENER DIODE



MA3091(M)

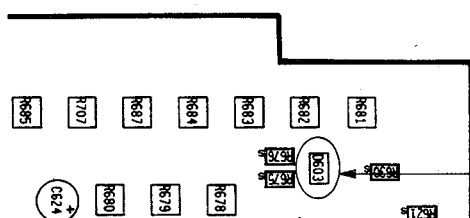


DIODE  
W06A



VARIABLE CAPACITOR  
DIODE  
1SV68

## PC board parts quick reference diagram



I	C	Q	D	VR	TP
				017	
			301	603	307
			303	305	

### Type of parts

IC: IC  
Q: Transistor  
D: Diode  
VR: Variable resistor  
TP: Test point

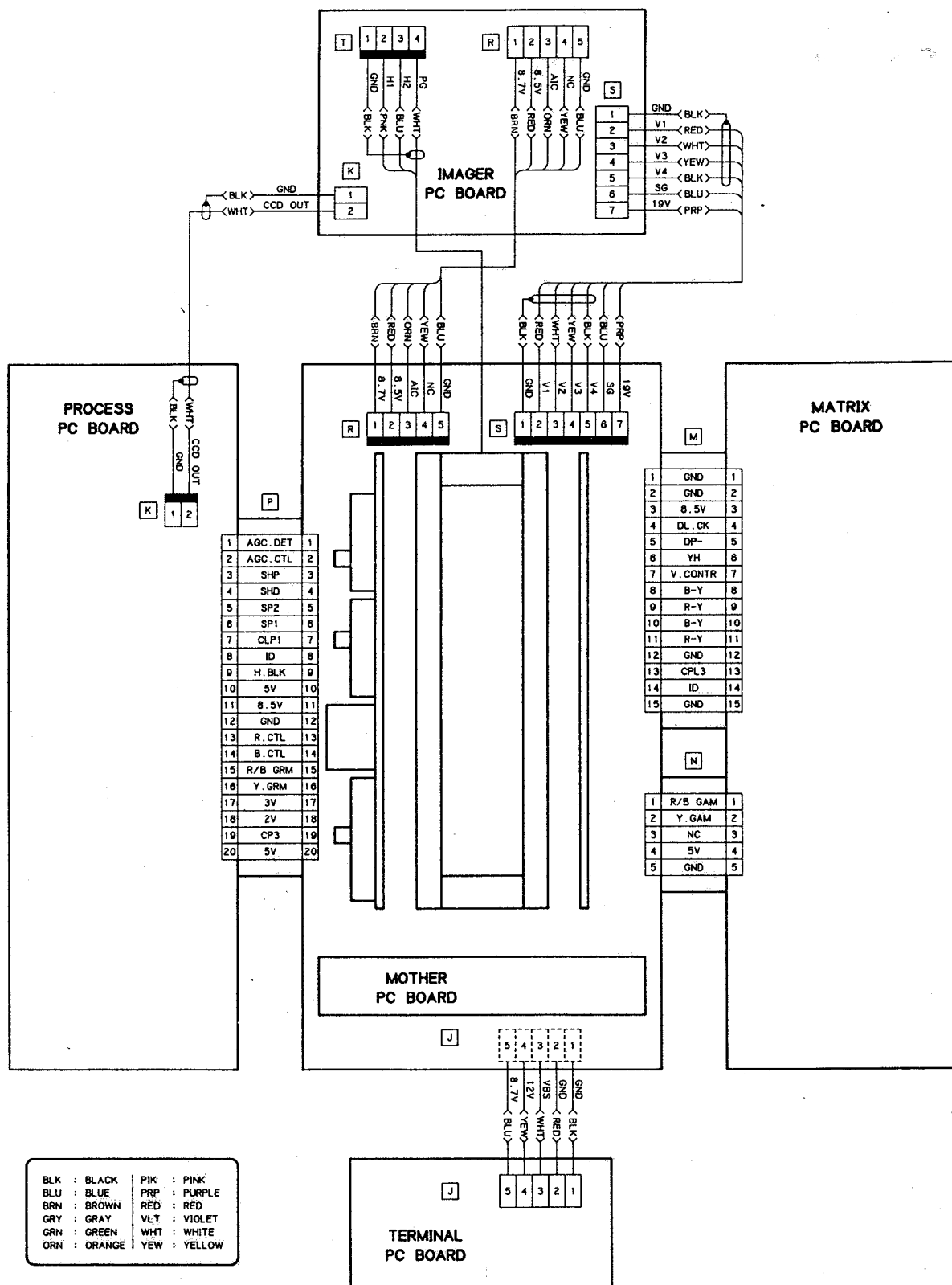
Indicates the parts location in the PC board. The part indicated with the symbol No. exists in the extended line. With the location in the quick reference diagram, the approximate parts locations can be obtained.

### Example: D603

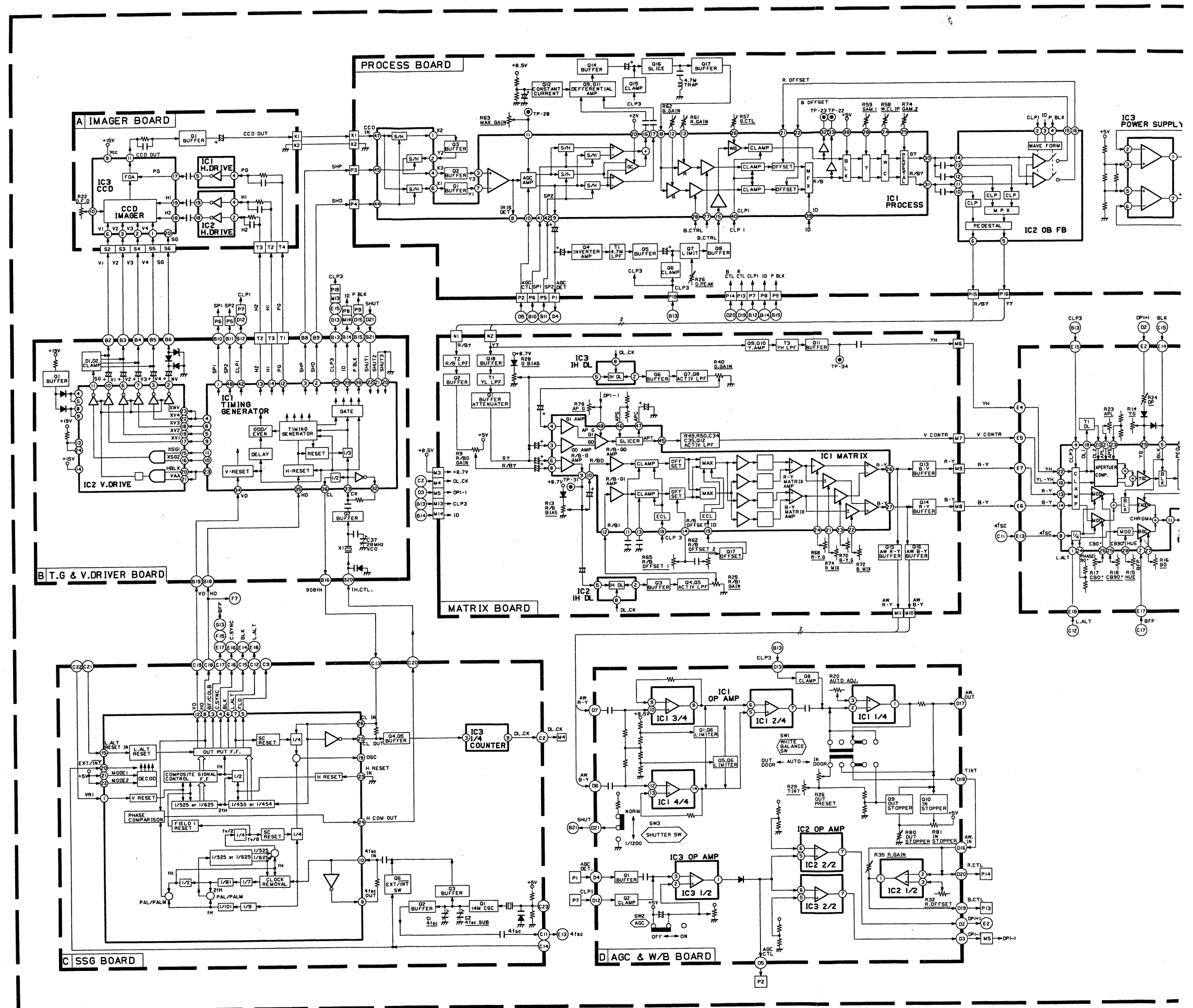
When symbol No. "D603" is given in the right side of the quick reference diagram, the diode D603 exists in the lateral extended line and in the right side of the PC board.



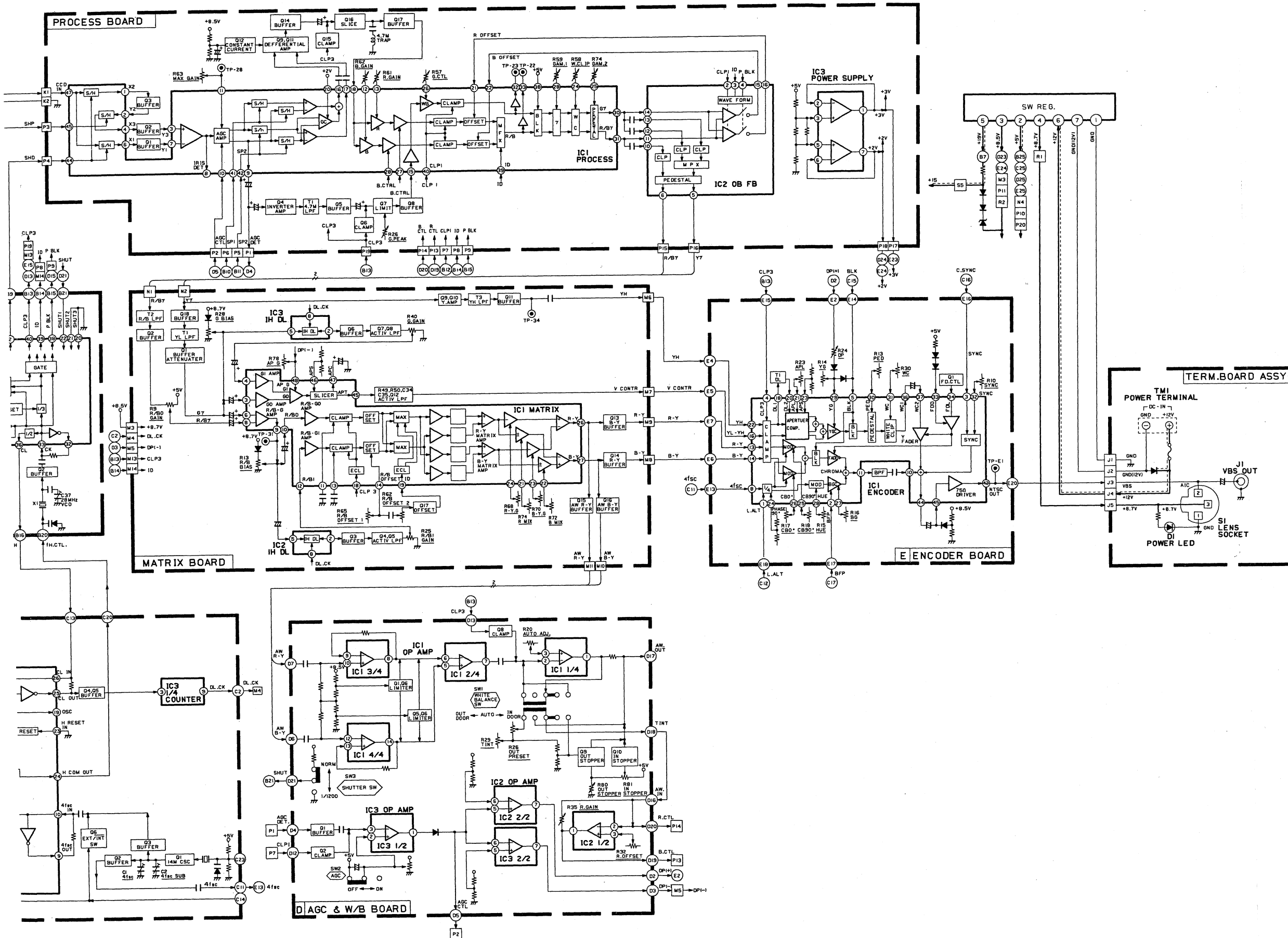
## 3. WIRING DIAGRAM



#### 4. BLACK DIAGRAM

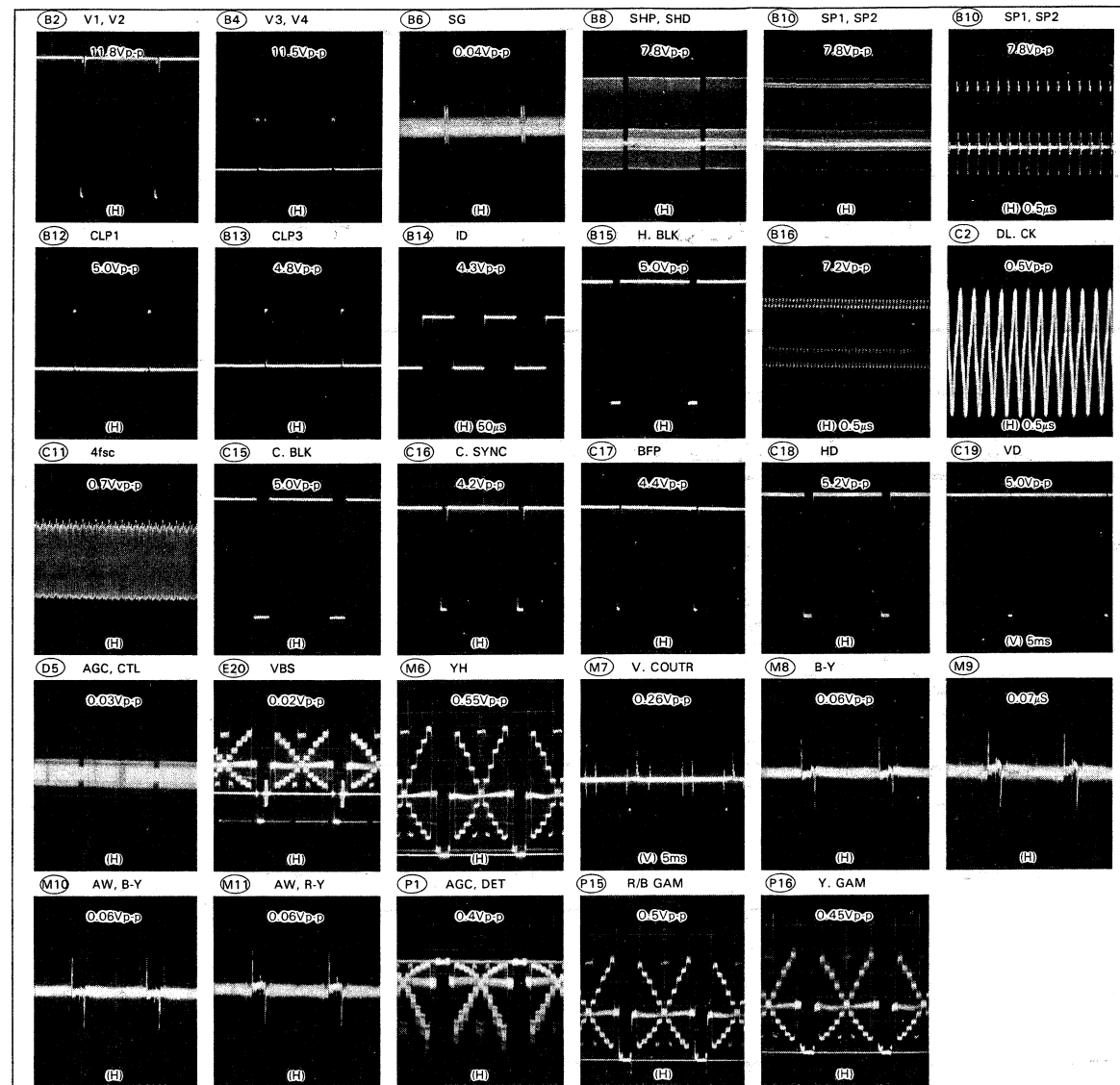


MOTHER BOARD

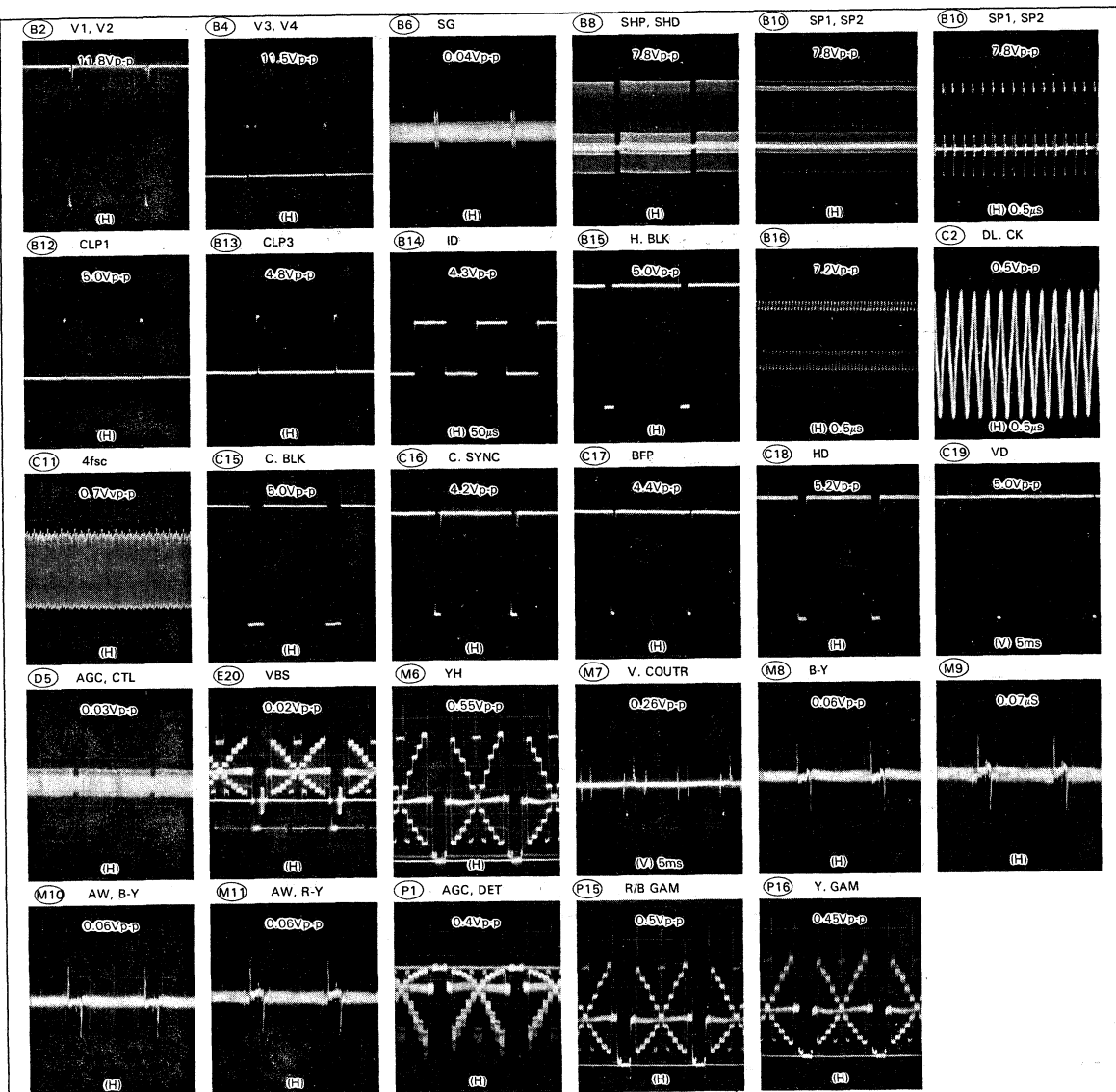


## ● WAVEFORMS

6. ☐ ( )

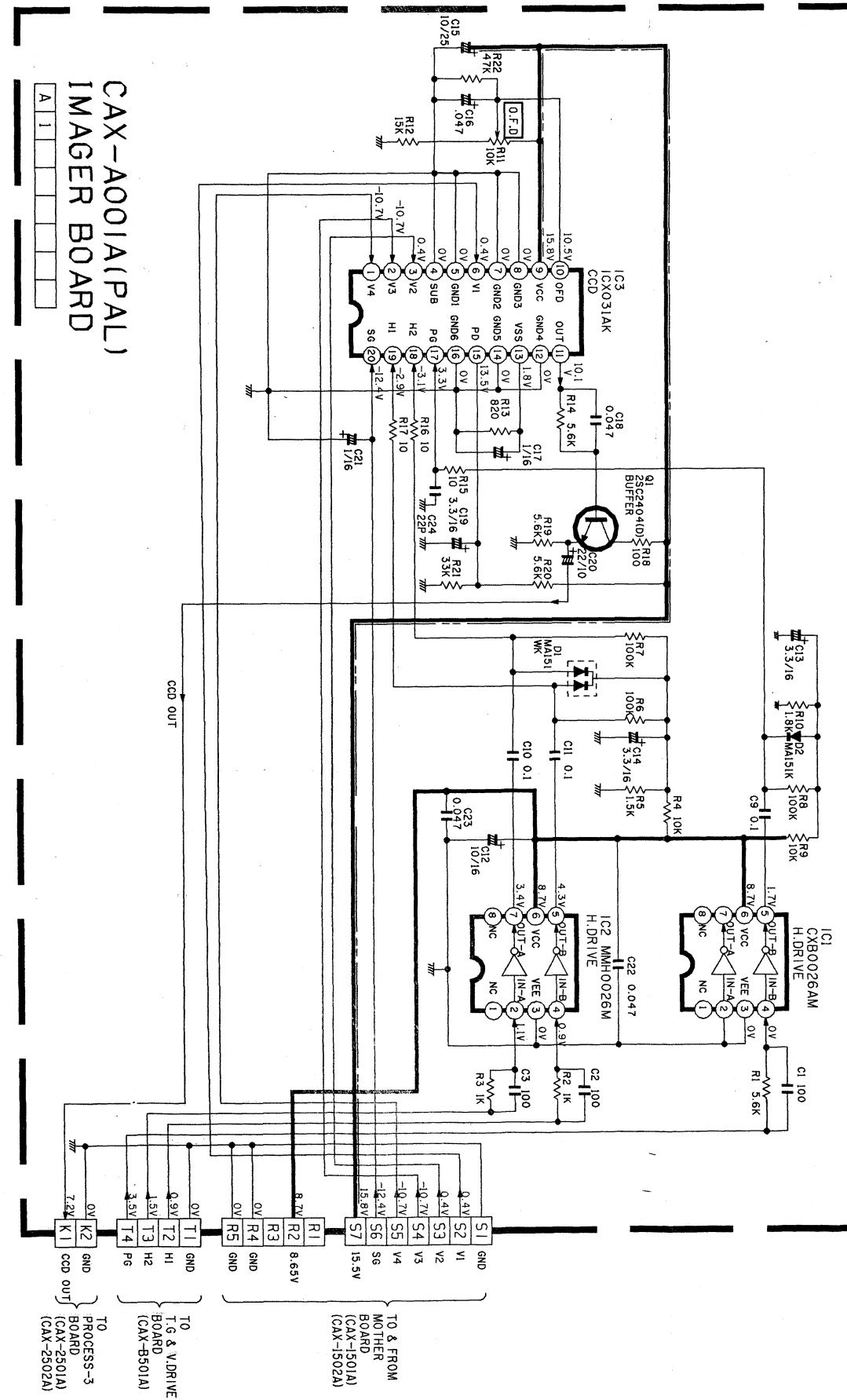


## WAVEFORMS

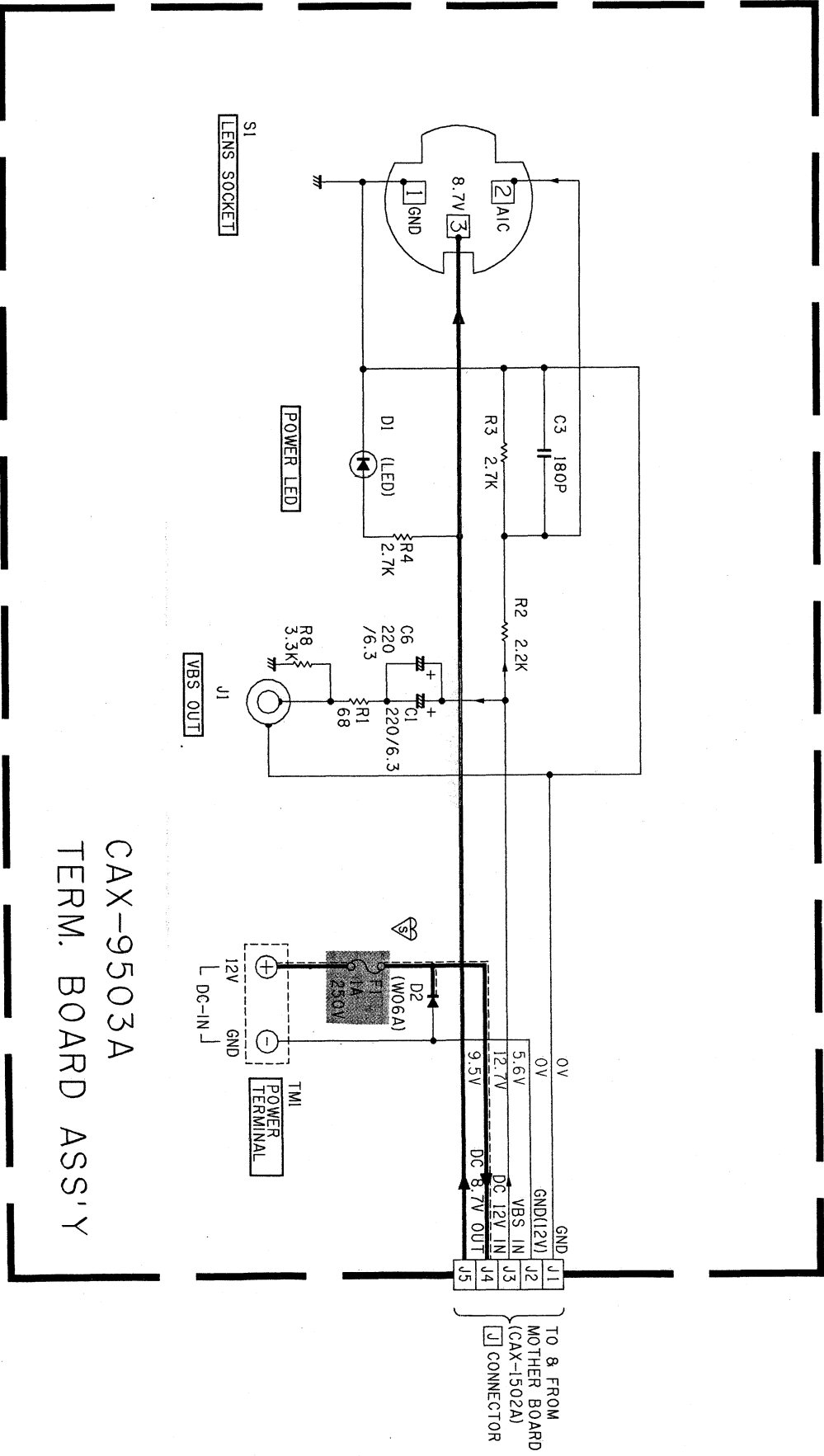


## 6. IMAGER BOARD (CAX-A001A)

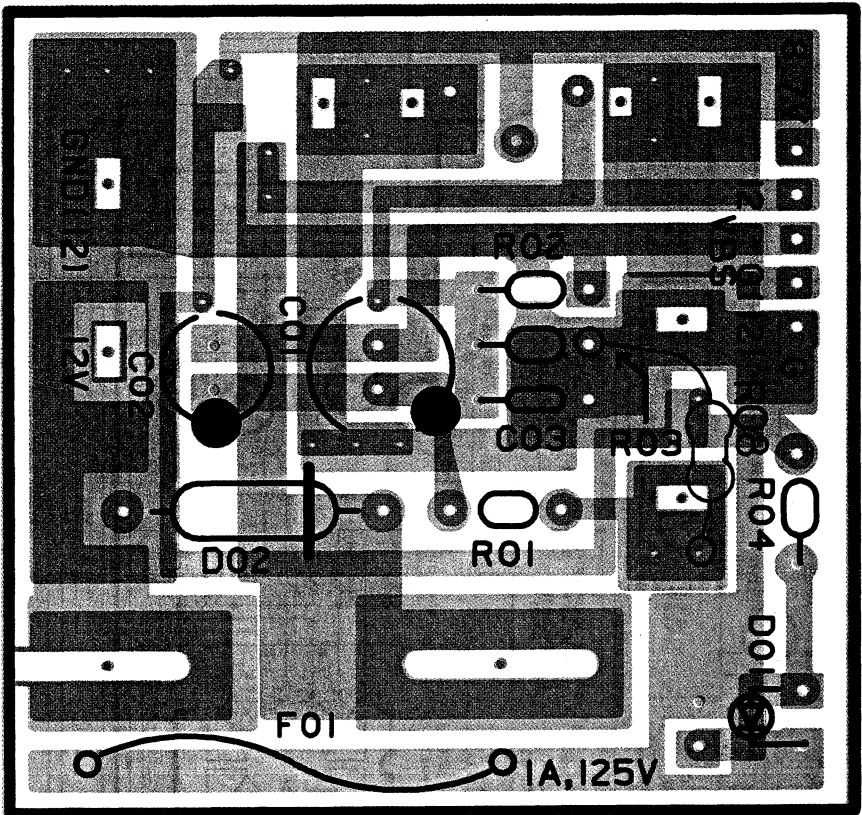
## ● CIRCUIT DIAGRAM



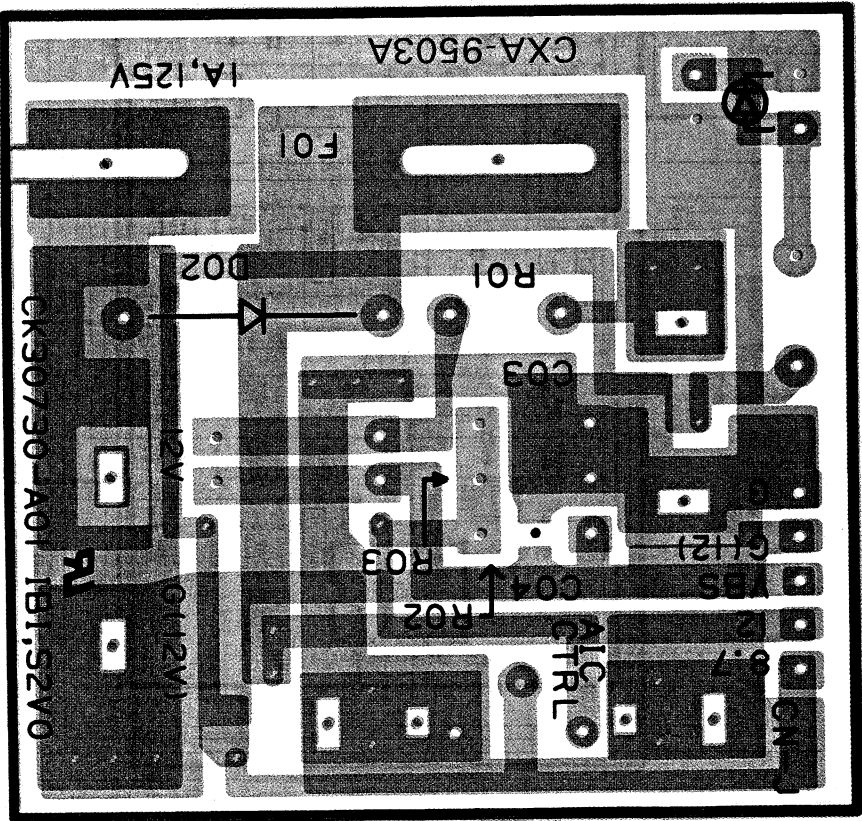
14. TERMINAL BOARD (CAX-9503A)  
● CIRCUIT DIAGRA



● BOARD DIAGRAM  
TOP



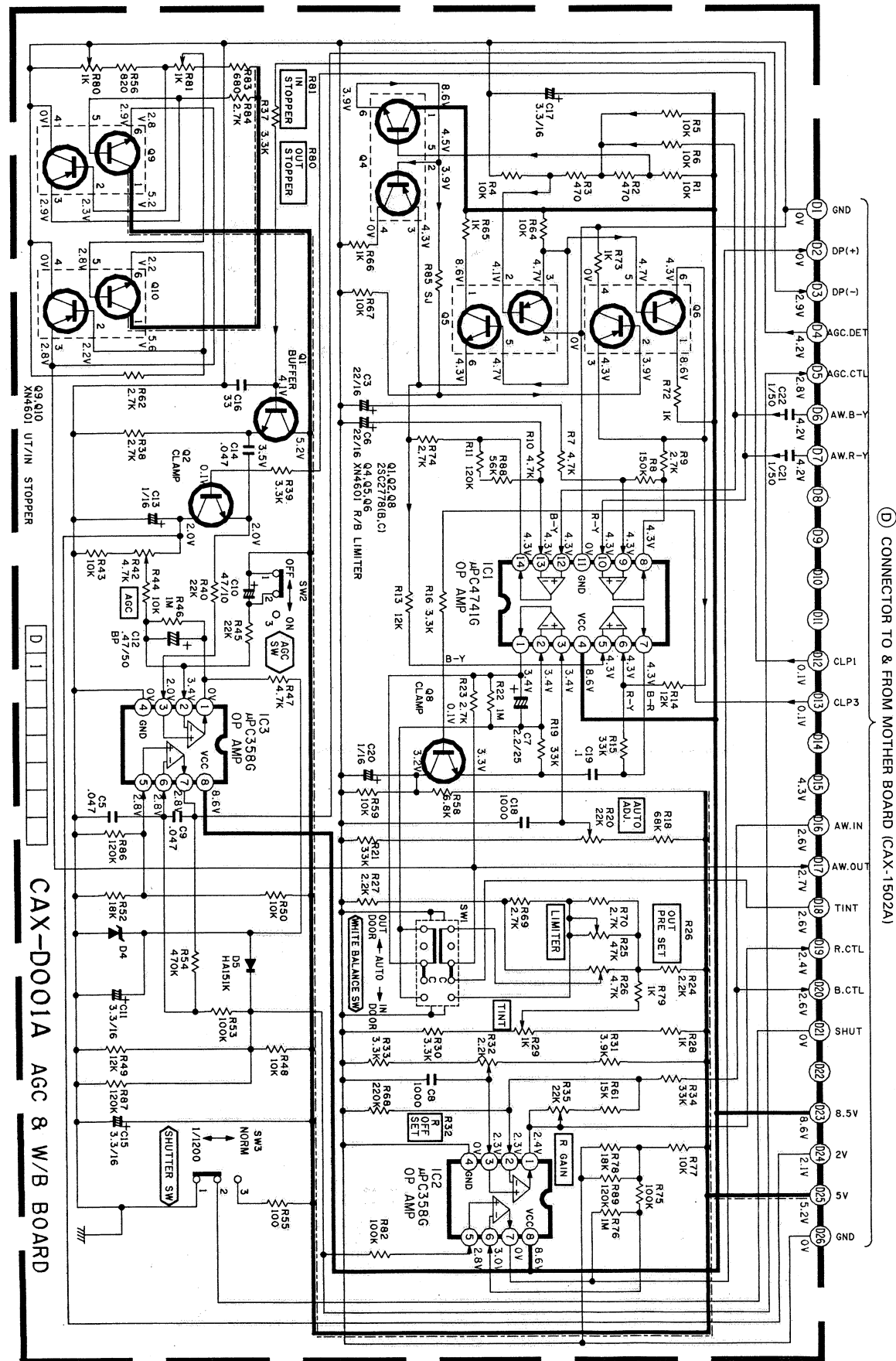
BOTTOM





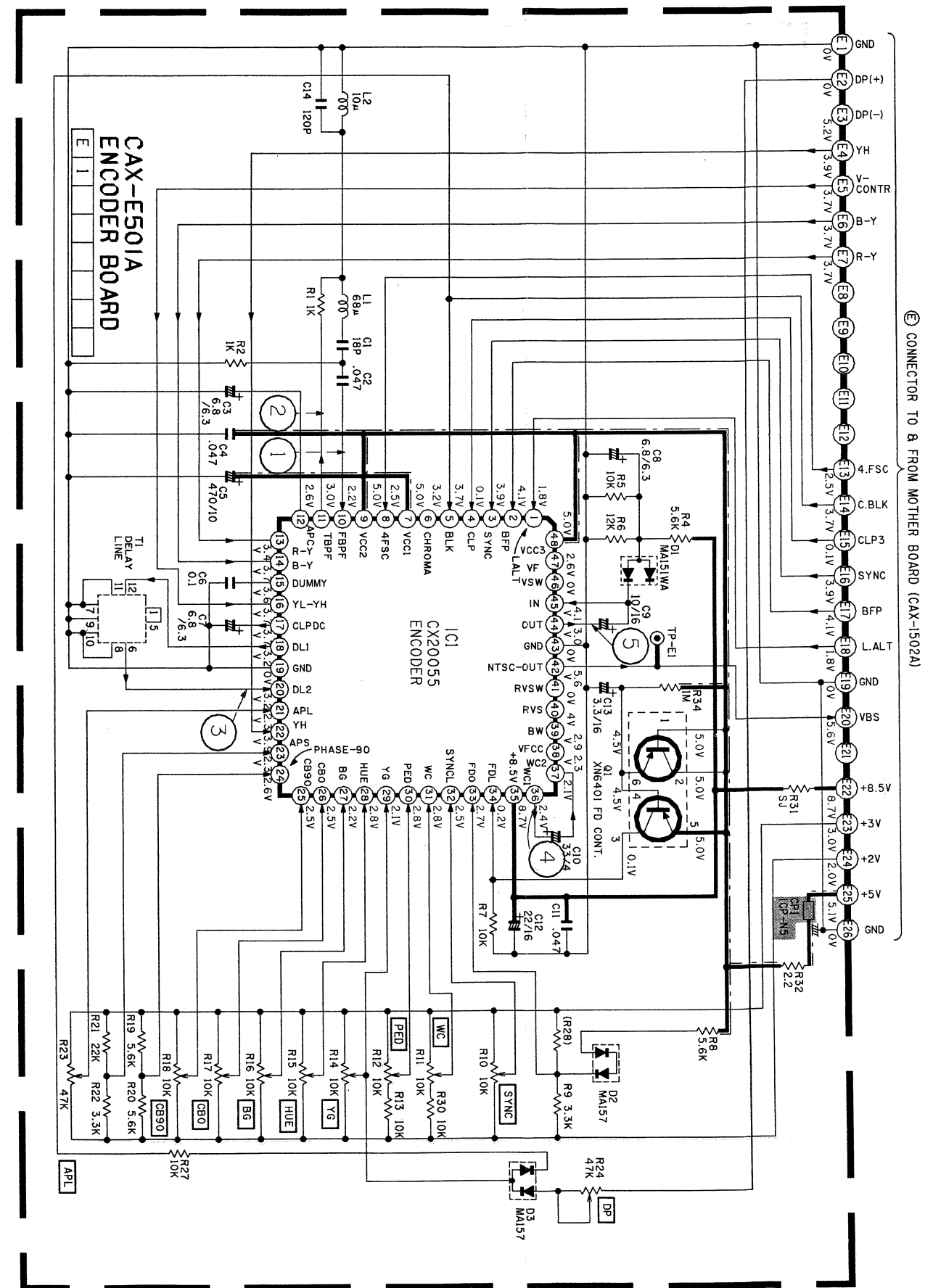
## 12. AGC &amp; W/B BOARD (CAX-D001A)

## ● CIRCUIT DIAGRAM

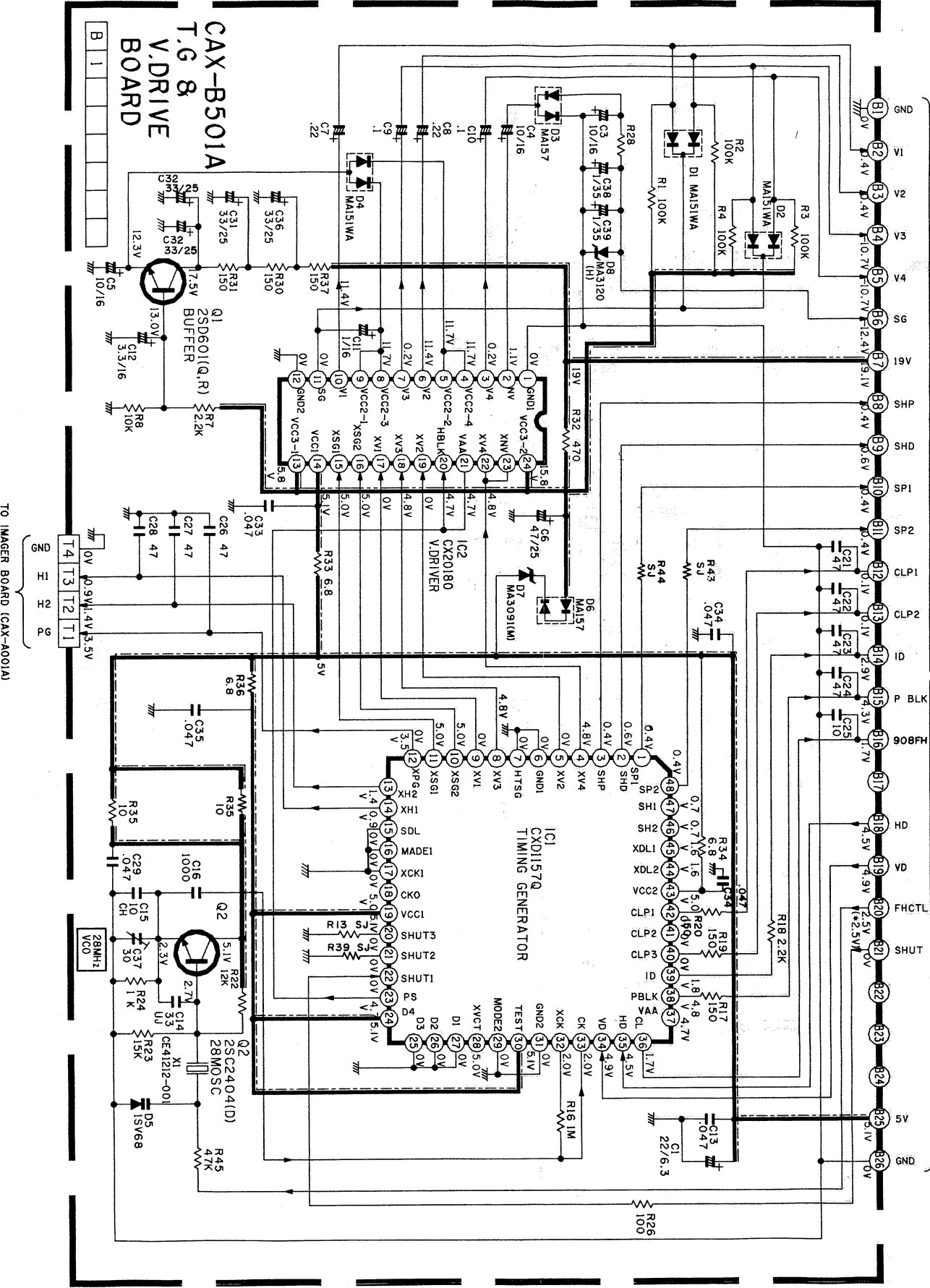


## 13. ENCODER BOARD (CAX-E501A)

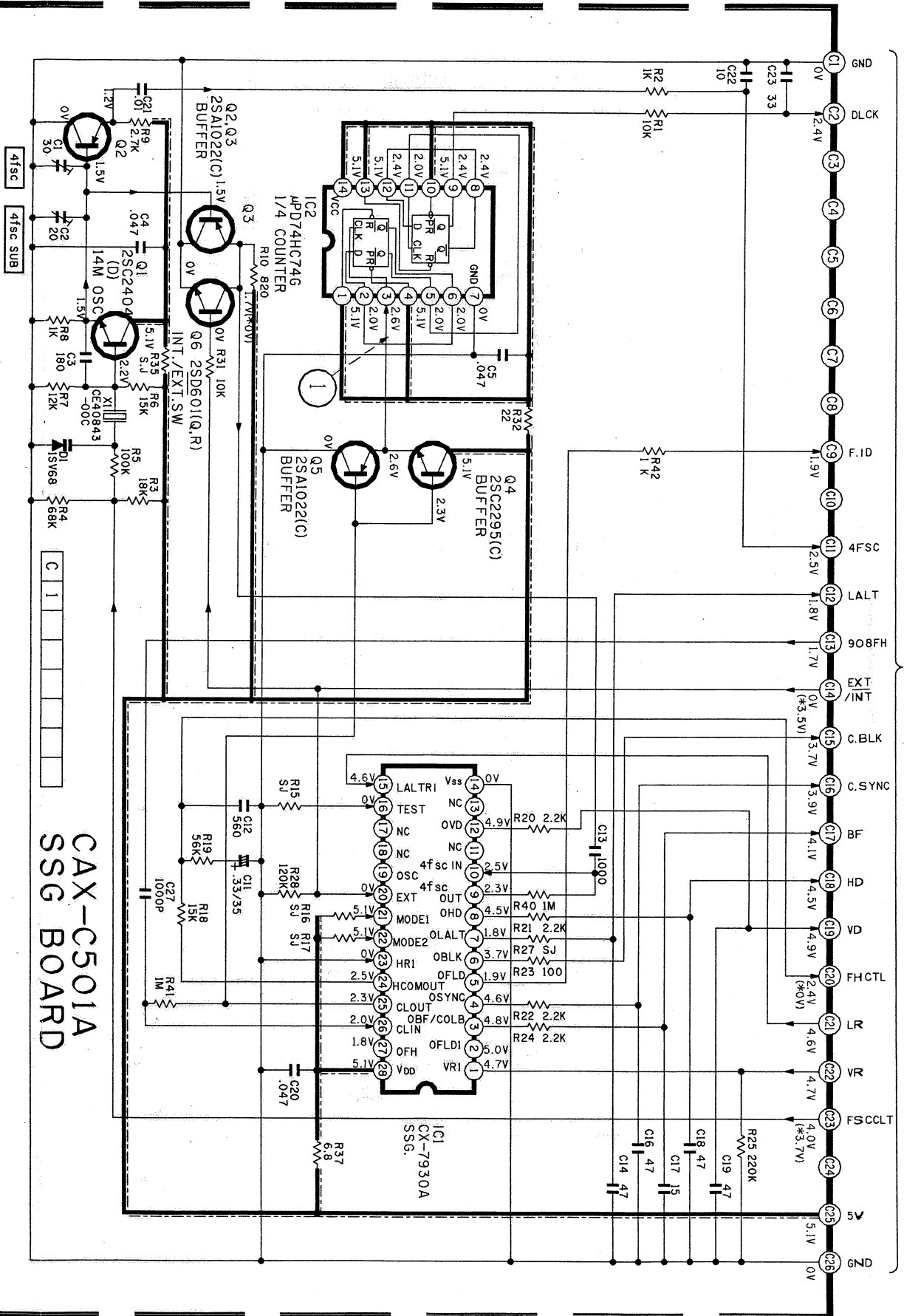
## ● CIRCUIT DIAGRAM



10. T.G. & H. DRIVE BOARD (CAX-B501A)  
● CIRCUIT DIAGRAM



11. SSG BOARD (CAX-C501A)  
● CIRCUIT DIAGRAM



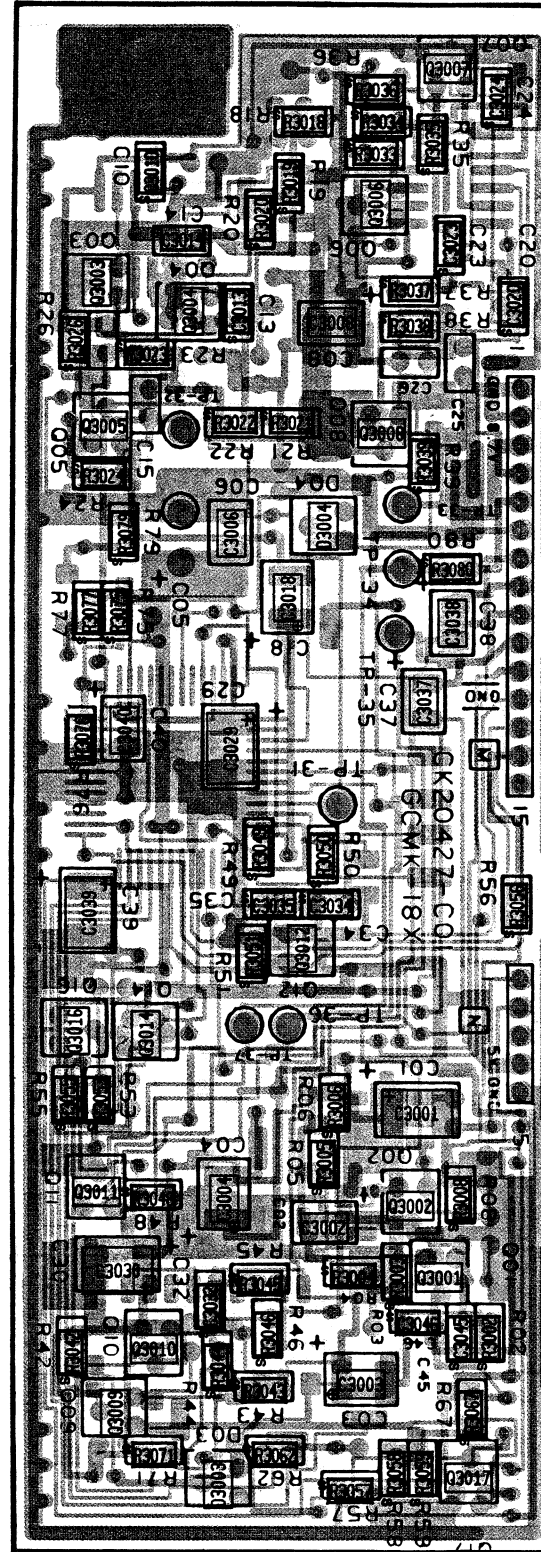


BOTTOM

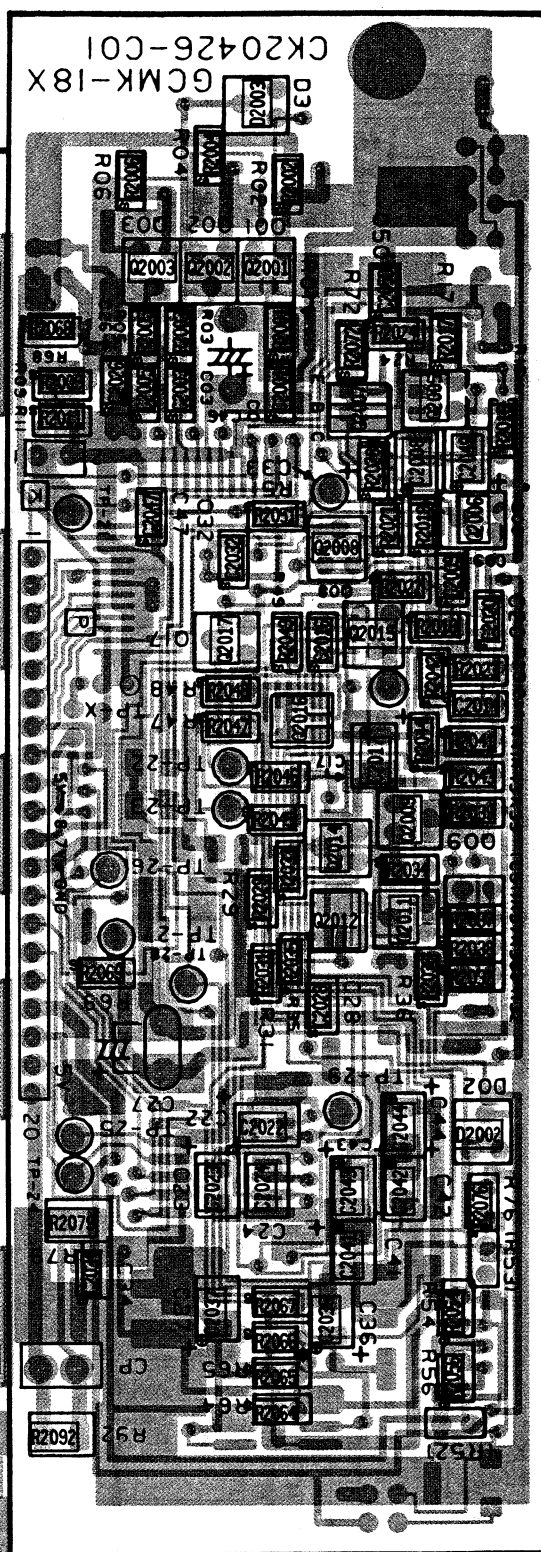
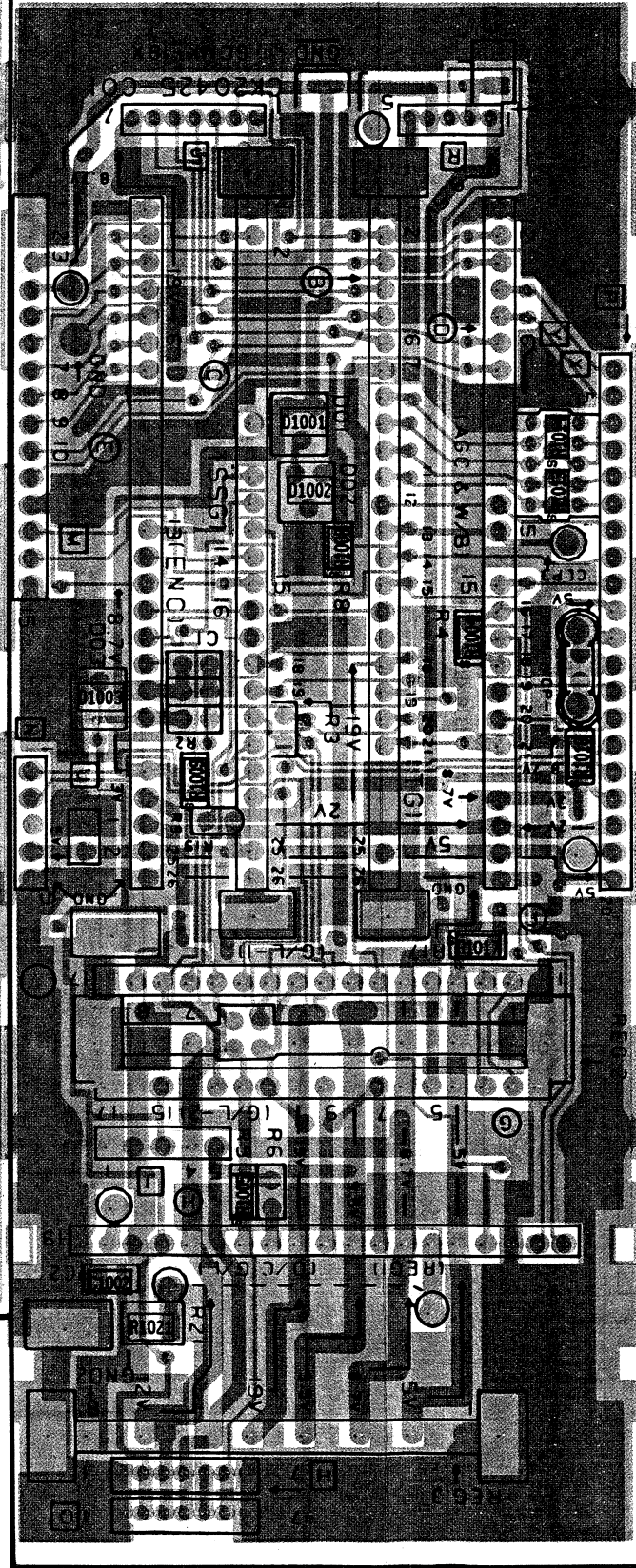
FRONT



Q, D
Q7
Q6
Q3
Q4
Q5
Q8
Q12
Q16
Q14
Q11
Q2
Q1
Q10
Q9
D3
Q17



D3	D1	D2
----	----	----



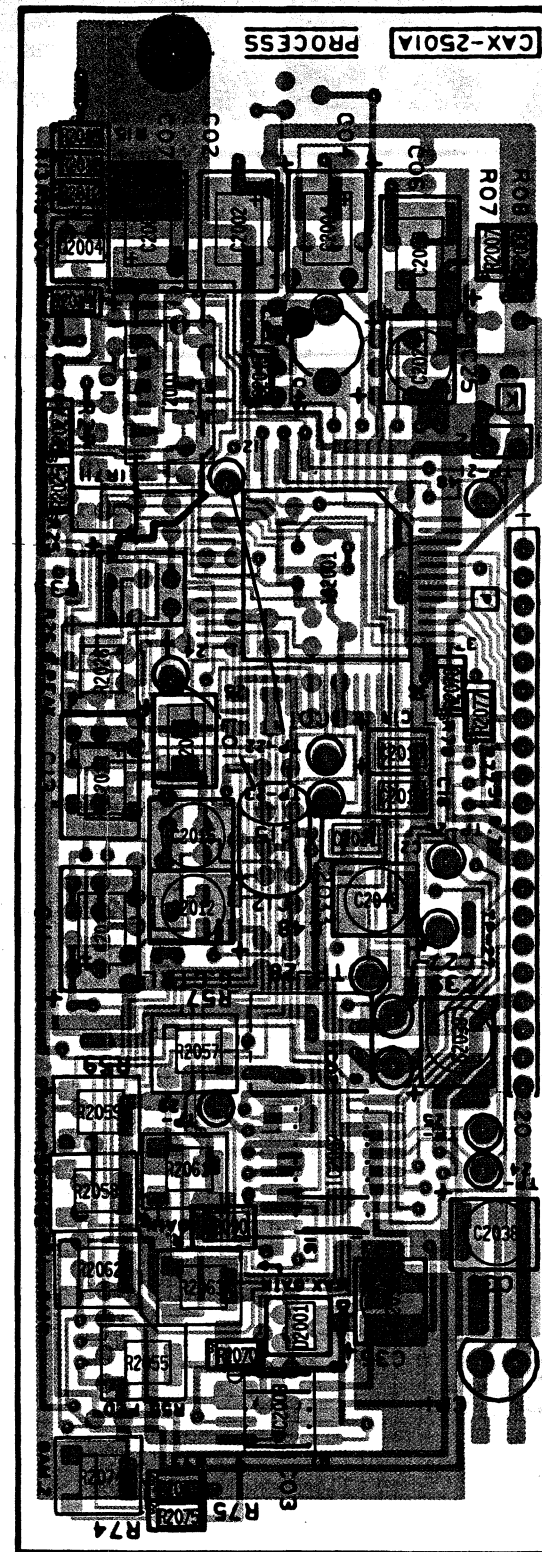
Q, D
Q1
Q5
Q7
Q6
Q8
Q15
Q17
Q16
Q9
Q14
Q11
Q12
D2

## 9. MOTHER, PROCESS, MATRIX BOARD

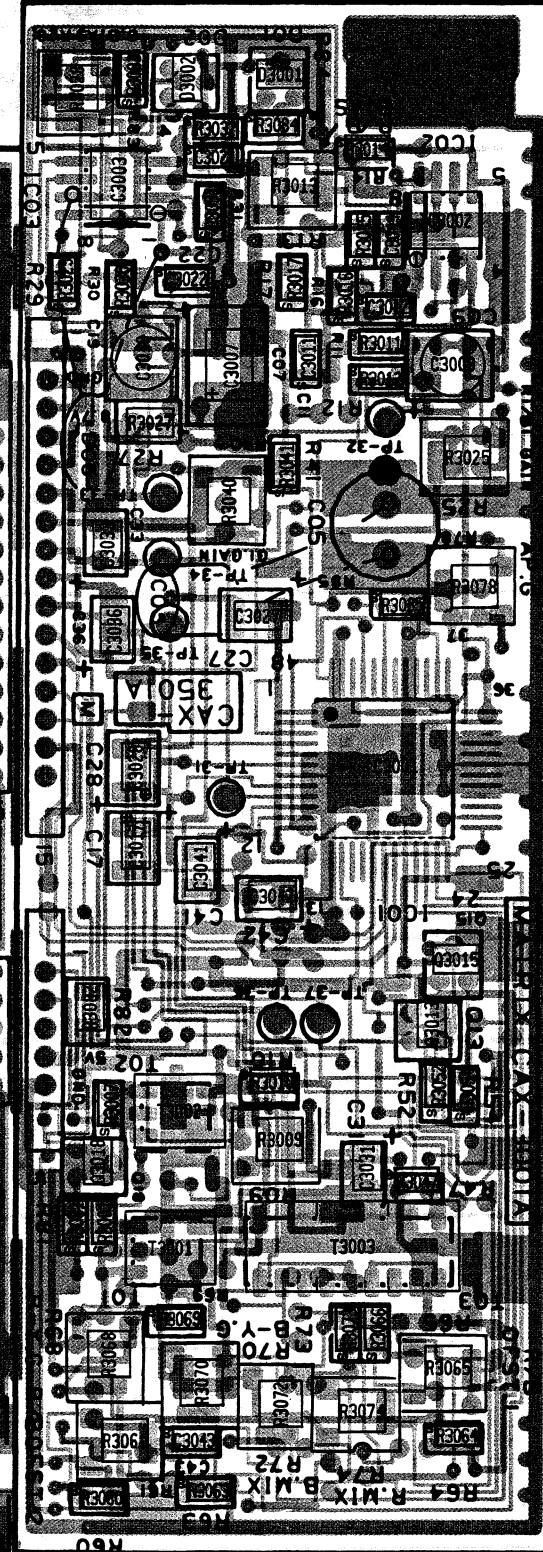
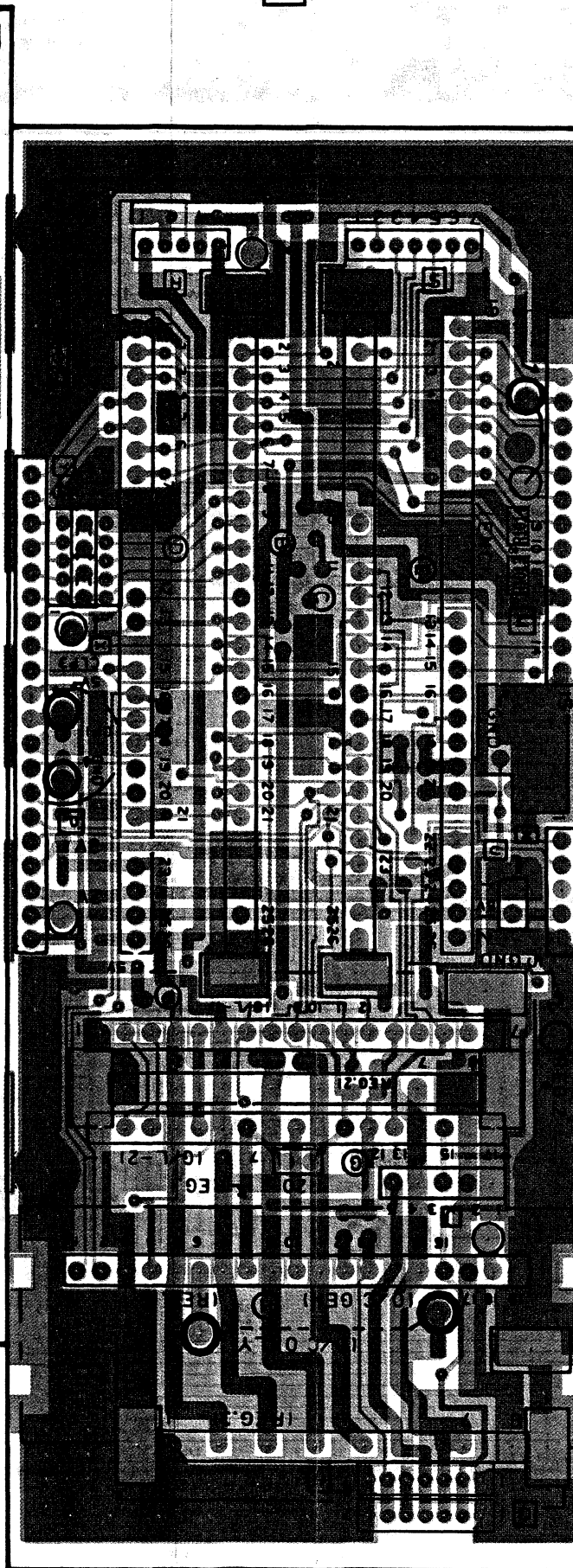
● BOARD DIAGRAM  
TOP

I C. QD. VR

Q4	I C1	R26	R57 R59	I C2	R61 R58	R62 R63	D1 R55	I C3	R74



FRONT



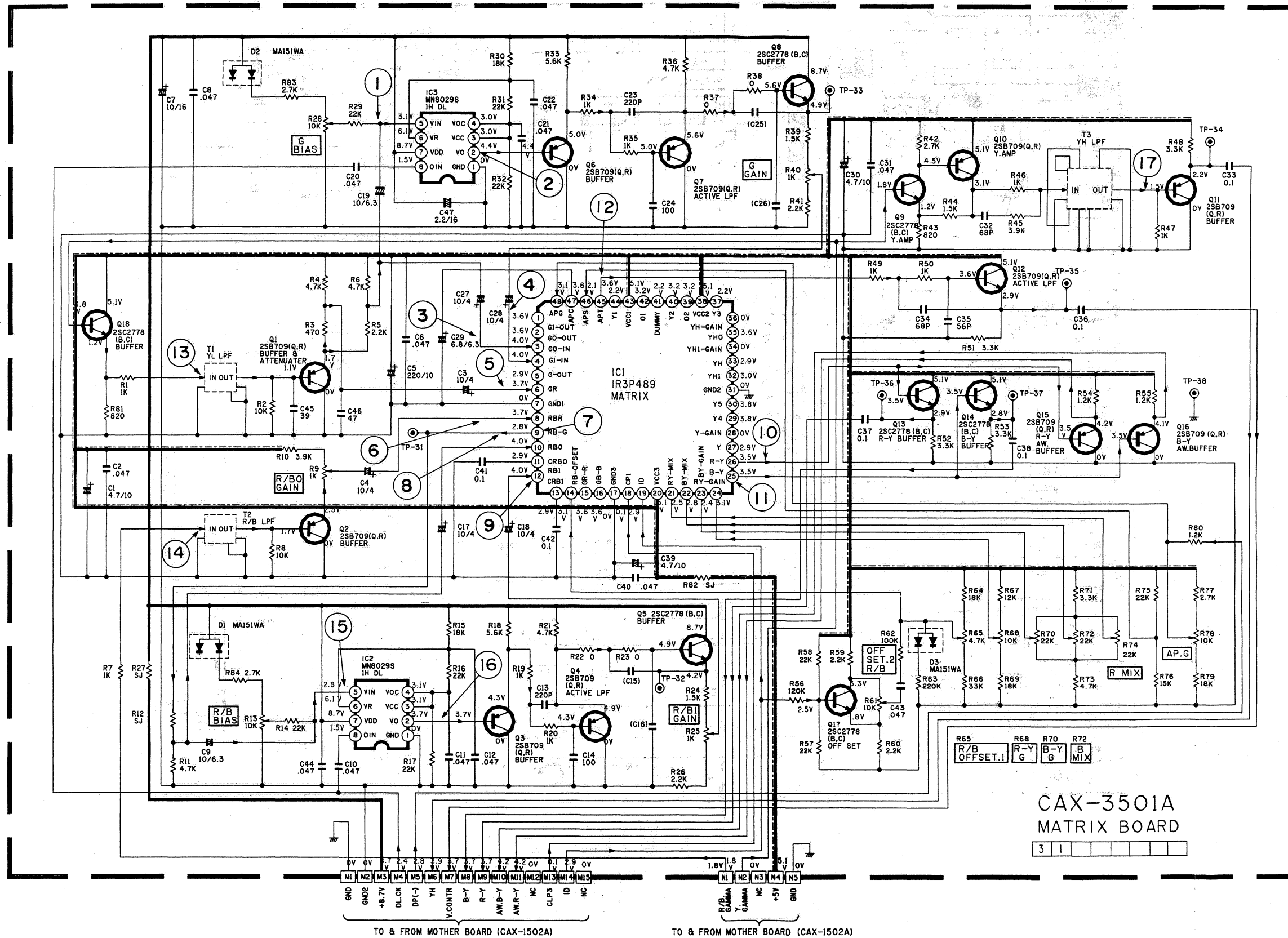
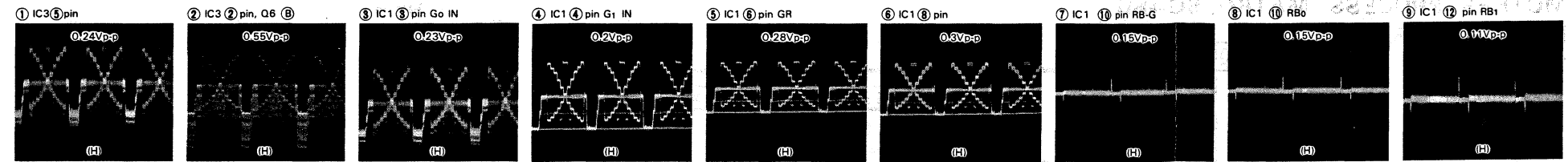
I C. QD. VR

I C3 I C2	R13	R25 R40	R78	I C1	Q15 Q13	Q18	R9	R68 R70 R72 R74 R61



## 8. MATRIX BOARD (CAX-3501A)

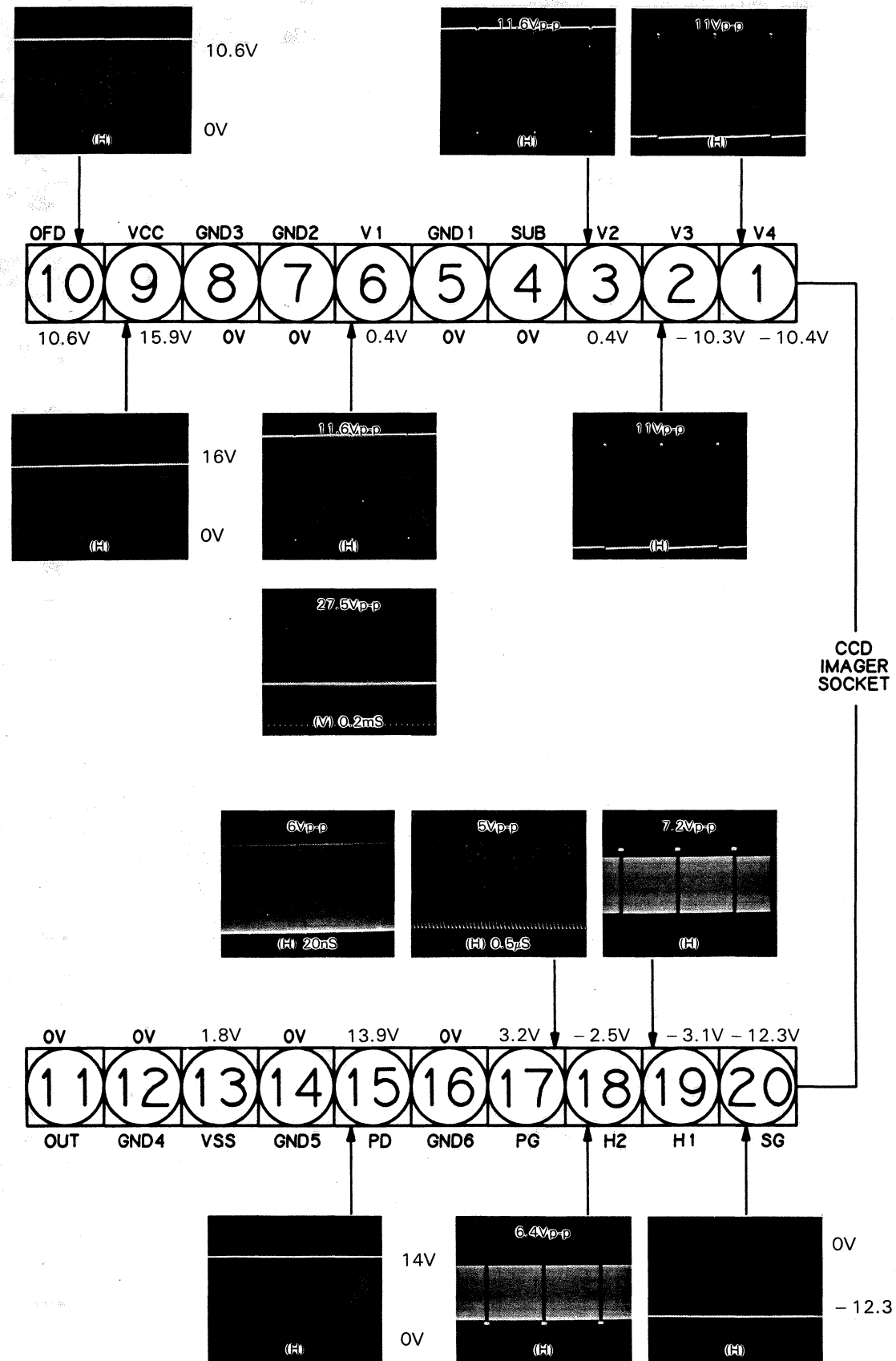
## ● CIRCUIT DIAGRAM





# ● IMAGER SOCKET OF WAVEFORM AND VOLTAGE DIAGRAM

After removing the imager (CCD) from the Imager board, the waveform and voltage shown in this diagram are measured at the imager socket.

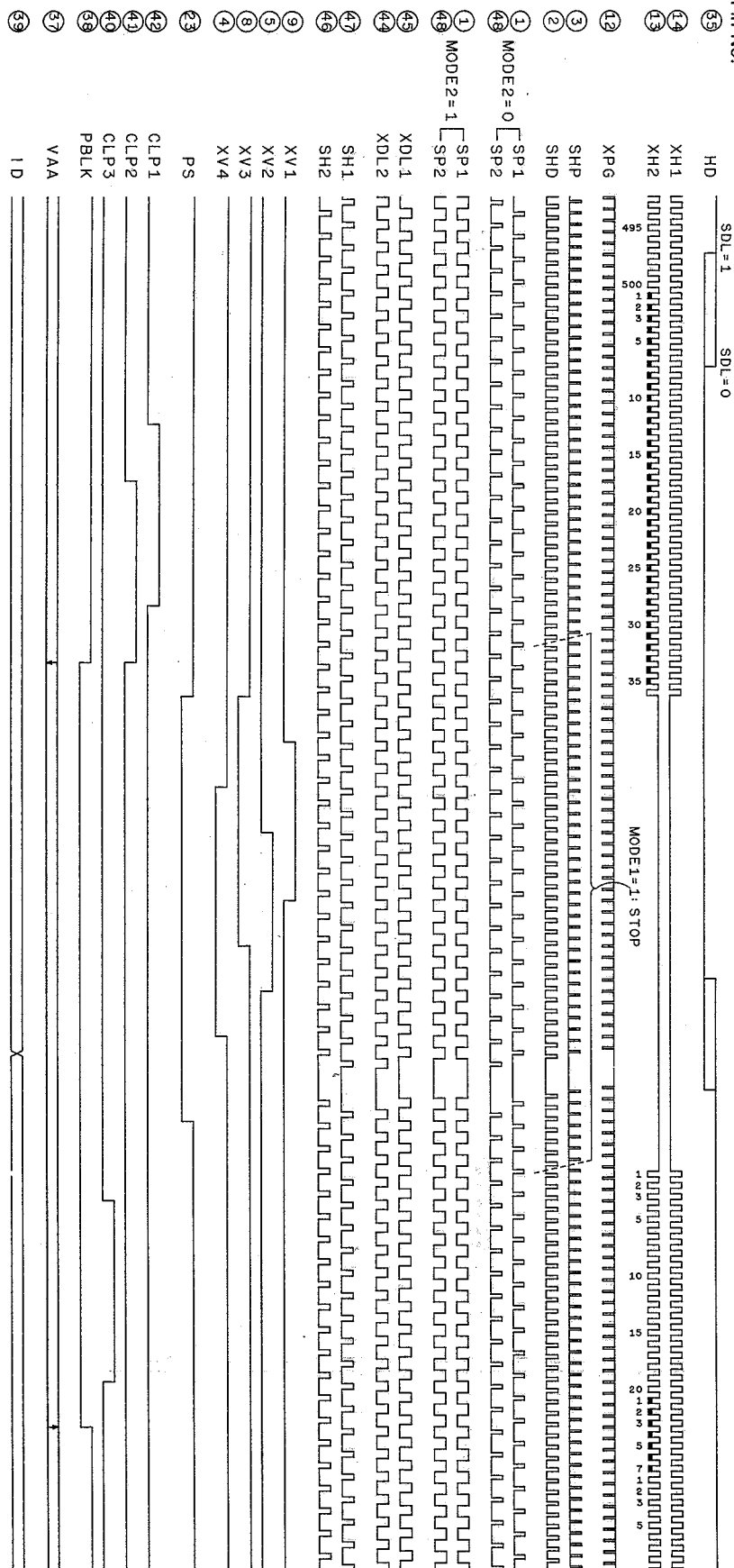


## 15. TIMING CHARTS

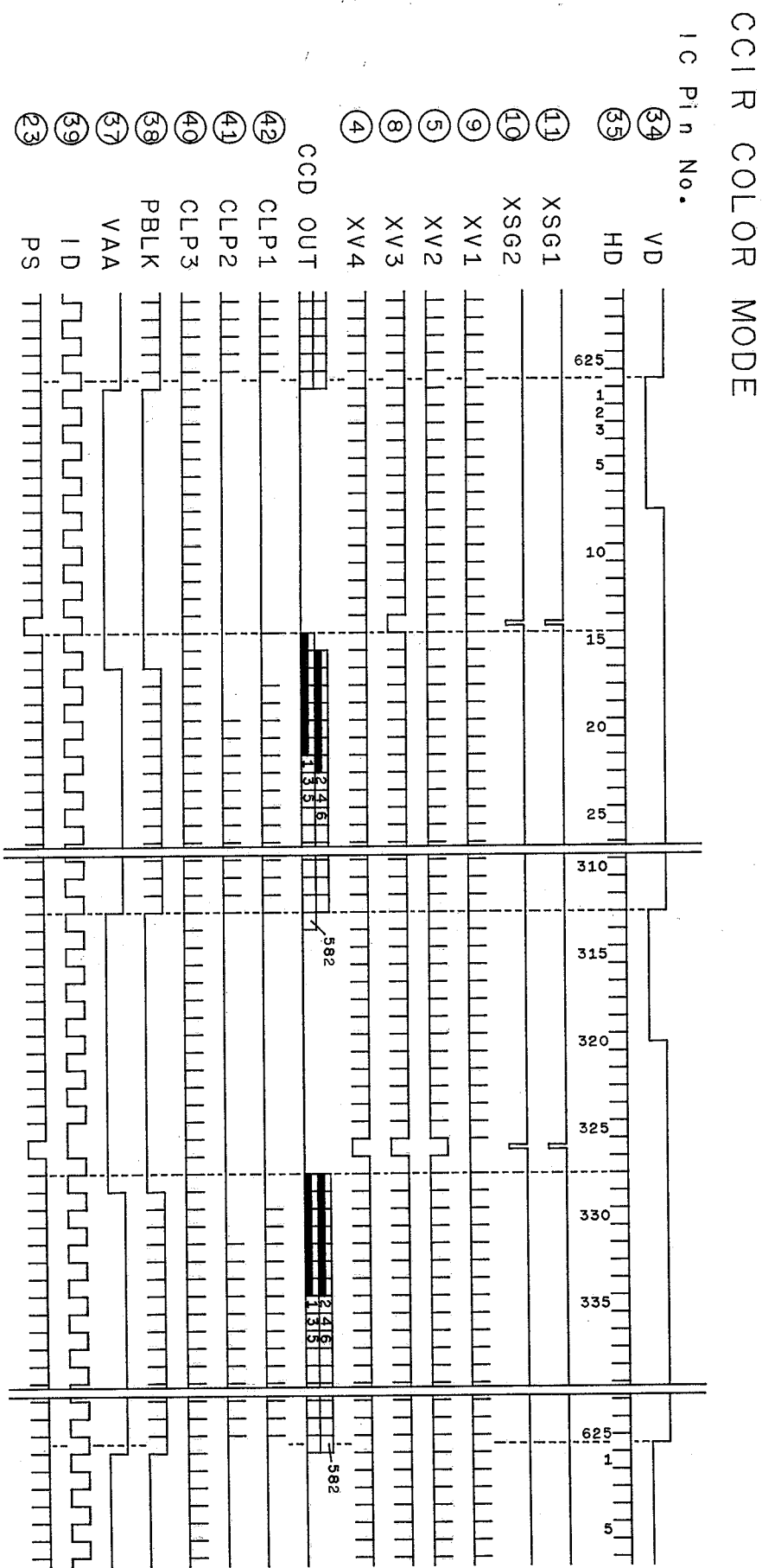
## ● TIMING CHARTS OF TIMING GENERATOR (CXD1157Q) OUTPUT WAVEFORMS

## CCIR COLOR MODE

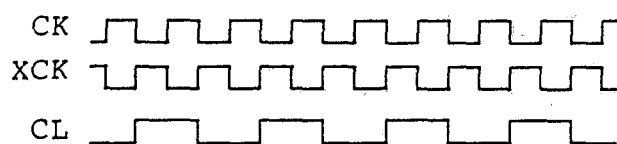
IC Pin No.



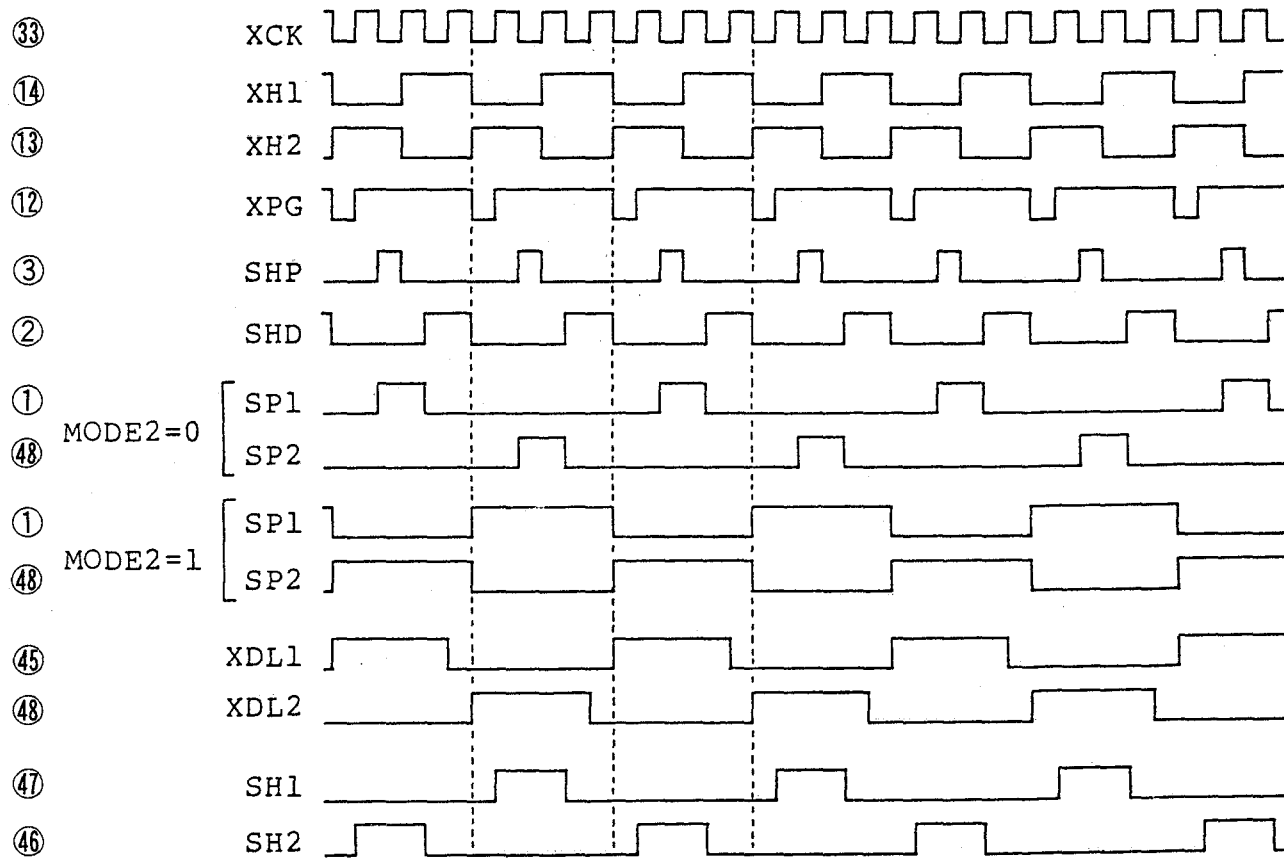
CXD1157Q



# **CXD1157Q** **High speed pulse-phase**

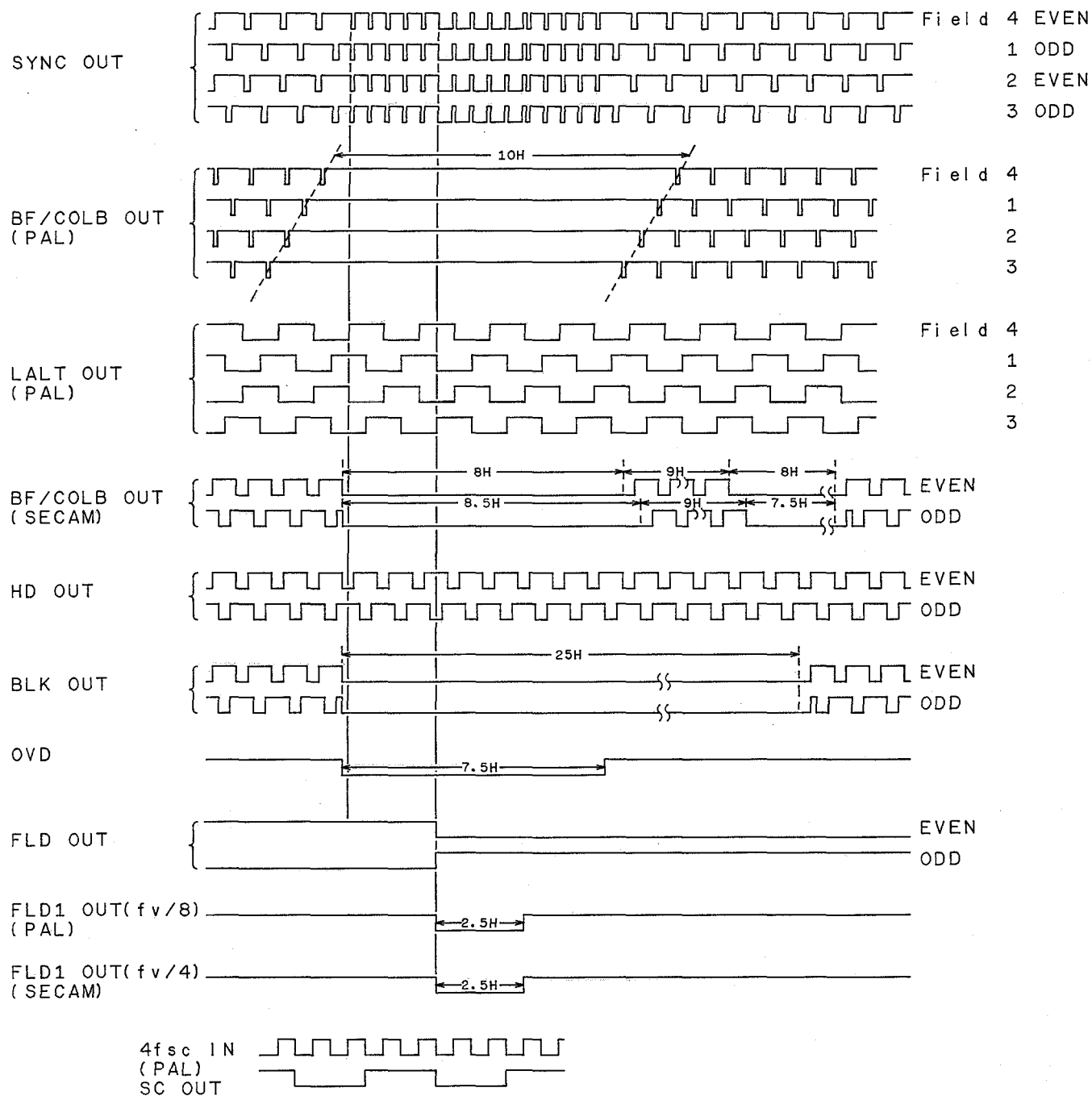


IC Pin No.





● TIMING CHARTS OF SSG (CX7930A) OUTPUT WAVEFORMS.



## CX7930A

